Installation and Service Instructions

for use by heating contractor

Vitorond 100, VR1 Series
Oil-Fired Boiler
Heating input 91 to 140 MBH
27 to 41 kW

VITOROND® 100

Product may not be exactly as shown

IMPORTANT

Read and save these instructions for future reference.

5583 571 - 01 01/2014

Please file in Service Binder

Important Safety, Installation, Regulatory and Warranty Requirements

Please ensure that these instructions are read and understood before commencing installation. Failure to comply with the instructions listed below and details printed in this manual can cause product/property damage, severe personal injury, and/or loss of life. Ensure all requirements below are understood and fulfilled (including detailed information found in manual subsections).

- **Product documentation**
  Read all applicable documentation before commencing installation. Store documentation near boiler in a readily accessible location for reference in the future by service personnel.

  ▶*For a listing of applicable literature, please see section entitled "Important Regulatory and Safety Requirements".*

- **Licensed professional heating contractor**
  The installation, adjustment, service and maintenance of this equipment must be performed by a licensed professional heating contractor.

  ▶*Please see section entitled "Important Regulatory and Installation Requirements".*

- **Contaminated air**
  Air contaminated by chemicals can cause by-products in the combustion process, which are poisonous to inhabitants and destructive to Viessmann equipment.

  ▶*For a listing of chemicals which cannot be stored in or near the boiler room, please see section entitled "Mechanical Room". in this manual.*

- **Advice to owner**
  Once the installation work is complete, the heating contractor must familiarize the system operator/ ultimate owner with all equipment, as well as safety precautions/requirements, shutdown procedure, and the need for professional service annually before the heating season begins.

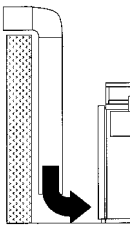
- **Warranty**
  Information contained in this and related product documentation must be read and followed. Failure to do so renders the warranty null and void.

- **Carbon monoxide**
  Improper installation, adjustment, service and/or maintenance can cause flue products to flow into living space. Flue products contain poisonous carbon monoxide gas.

  ▶*For information pertaining to the proper installation, adjustment, service and maintenance of this equipment to avoid formation of carbon monoxide, please see section entitled "Combustion air supply" and "Venting information" in this manual.*

- **Fresh air**
  This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

  ▶*For information pertaining to the fresh air requirements of this product, please see subsection entitled "Mechanical Room" in this manual.*



- **Equipment venting**
  Never operate boiler without an installed venting system. An improper venting system can cause carbon monoxide poisoning.

  ▶*For information pertaining to venting and chimney requirements, please see section entitled "Venting Information" in this manual. All products of combustion must be safely vented to the outdoors.*

⚠ WARNING

Installers must follow local regulations with respect to installation of carbon monoxide detectors. Follow the Viessmann maintenance schedule of the boiler in the "Service Instructions" manual.

Important Safety, Installation, Regulatory and Warranty Requirements *(continued)*

■ **Fiberglass wool and ceramic fiber materials**

⚠ WARNING

Inhaling of fiberglass wool and/or ceramic fiber materials is a possible cancer hazard. These materials can also cause respiratory, skin and eye irritation.

The state of California has listed the airborne fibers of these materials as a possible cancer hazard through inhalation. When handling these materials, special care must be applied.

Suppliers of ceramic fiber products recommend the following first aid measures:

- *Respiratory tract (nose and throat) irritation:* If respiratory tract irritation develops, move the person to a dust free location.
- *Eye irritation:* If eyes become irritated, flush immediately with large amounts of lukewarm water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Do not rub eyes.
- *Skin irritation:* If skin becomes irritated, remove soiled clothing. Do not rub or scratch exposed skin. Wash area of contact thoroughly with soap and water. Using a skin cream or lotion after washing may be helpful.
- *Gastrointestinal irritation:* If gastrointestinal tract irritation develops, move the person to a dust free environment.

Suppliers of fiberglass wool products recommend the following precautions be taken when handling these materials:

Precautionary measures

- Avoid breathing fiberglass dust and contact with skin and eyes.
- Use NIOSH approved dust/mist respirator.
- Wear long-sleeved, loose fitting clothing, gloves and eye protection.
- Wash work clothes separately from other clothing. Rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out and spraying may generate airborne fiber concentration requiring additional protection.

First aid measures

- If eye contact occurs, flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- If skin contact occurs, wash affected areas gently with soap and warm water after handling.

■ **Hazardous materials**

⚠ WARNING

Appliance materials of construction, products of combustion and the fuel contain alumina, silica, heavy metals, carbon monoxide, nitrogen oxides, aldehydes and/or other toxic or harmful substances which can cause serious injury or loss of life and which are known to the State of California to cause cancer, birth defects and other reproductive harm. Always use proper safety clothing, respirators and equipment when servicing or working nearby the appliance.

Page

Safety

Important Safety, Installation, Regulatory and Warranty Requirements....2

General Information

About these Instructions....8
Product Information....9
Mechanical Room....10
Combustion Air Supply....10

Set-up

Product Delivery....12
Unpacking Instructions....12
Minimum Clearances to Combustibles....13
Recommended Minimum Clearances for Service....13
Boiler Set-up and Location....14
Combustion Chamber Insert....14

Connections

Venting Connection....15
Water Side Connections (with Hydrostat 3250-*Plus* Control)....17
Safety Connections (with Hydrostat 3250-Plus Control)....18
Water Side Connections (with Vitotronic Control)....20
Safety Connections (with Vitotronic Control)....21
Pressure Testing....23

Becket Burner Set-up

Burner Installation....24
Burner Information....24
Burner Mounting....25
Oil Piping Connection....26
Electrical Connections (with Hydrostat 3250-*Plus* Control)....27
Electrical Connections (with Vitotronic Control)....30
Installation of Vitotronic Control....32
Boiler Coding Card....33
Electrical Connections (with GeniSys Primary Control)....34

Riello Burner Set-up

Burner Installation....35
Burner Information....35
Burner Mounting....36
Oil Piping Connection....37
Electrical Connections (with Hydrostat 3250-*Plus* Control)....39
Electrical Connections (with Vitotronic Control)....40
Installation of Vitotronic Control....43
Boiler Coding Card....44

Page

Start-up

Initial Start-up....45
Burner Calibration....46
Beckett Burner Calibration 47
Riello Burner Calibration....48
Barometric Draft Regulator....49
Waterside Flow....49

Connections

Installation Examples - Hydrostat 3250-*Plus*....50
Installation Examples - Vitotronic....51

Service

Necessary Tools....54
Service Procedure....54
Shut-down heating system....54
Open combustion chamber door....54
Clean heat exchanger and flue pipe....55
Check all gaskets and insulation....55
Close combustion chamber door....55
Check heating system and domestic hot water connections....56
Ensure proper operation of expansion tank, low water cut-off (if applicable) and pumps....56
Ensure that an adequate combustion air supply exists in the boiler room....56
Ensure functionality of the barometric draft regulator of the burner....56
Calibrate the Burner....57

Additional Information

Parts List....58
Maintenance Record....61

Important Safety, Installation, Regulatory and Warranty Requirements *(continued)*

For installations on the Commonwealth of Massachusetts, the following modifications to NFPA-54 chapter 10 apply:

Excerpt from 248 CMR 5-08:

2(a) For all side-wall horizontally vented gas fueled equipment installed in every dwelling, building or structure used in whole or in part for residential purposes, including those owned or operated by the Commonwealth and where the side-wall exhaust vent termination is less than (7) feet above finished grade in the area of the venting, including but not limited to decks and porches, the following requirements shall be satisfied:

1. INSTALLATION OF CARBON MONOXIDE DETECTORS. At the time of installation of the side-wall horizontal vented gas fueled equipment, the installing plumber or gas fitter shall observe that a hard wired carbon monoxide detector with an alarm and battery back-up is installed on the floor level where the gas equipment is to be installed. In addition, the installing plumber or gas fitter shall observe that a battery operated or hard wired carbon monoxide detector with an alarm is installed on each additional level of the dwelling, building or structure served by the side-wall horizontal vented gas fueled equipment. It shall be the responsibility of the property owner to secure the services of qualified licensed professional for the installation of hard-wired carbon monoxide detectors.

a. In the event that the side-wall horizontally vented gas fueled equipment is installed in a crawl space or an attic, the hard-wired carbon monoxide detector with alarm and battery back-up may be installed on the next adjacent floor level.

b. In the event that the requirements of this subdivision can not be met at the time of completion of installation, the owner shall have a period of thirty (30) days to comply with the above requirements; provided, however, that during said thirty (30) day period, a battery operated carbon monoxide detector with an alarm shall be installed.

2. APPROVED CARBON MONOXIDE DETECTORS. Each carbon monoxide detector as required in accordance with the above provisions shall comply with NFPA 720 and be ANSI/UL 2034 listed and IAS certified.

3. SIGNAGE. A metal or plastic identification plate shall be permanently mounted to the exterior of the building at a minimum height of eight (8) feet above grade directly in line with the exhaust vent terminal for the horizontally vented gas fueled heating appliance or equipment. The sign shall read, in print size no less than one-half (½) inch in size, "GAS VENT DIRECTLY BELOW. KEEP CLEAR OF ALL OBSTRUCTIONS".

4. INSPECTION. The state or local gas inspector of the side-wall horizontally vented gas fueled equipment shall not approve the installation unless, upon inspection, the inspector observes carbon monoxide detectors and signage installed in accordance with the provisions of 248 CMR 5.08(2)(a) 1 through 4.

(b) EXEMPTIONS: The following equipment is exempt from 248 CMR 5.08(2)(a) 1 through 4:

1. The equipment listed in Chapter 10 entitled "Equipment Not Required To Be Vented" in the most current edition of NFPA 54 as adopted by the Board; and

2. Product Approved side-wall horizontally vented gas fueled equipment installed in a room or structure separate from the dwelling, building or structure used in whole or in part for residential purposes.

Important Safety, Installation, Regulatory and Warranty Requirements *(continued)*

Codes

The installation of this unit shall be in accordance with local codes. In the absence of local codes, use:

- CAN/CSA-B139.00 for oil Installations in Canada
- NFPA 31 Standard for the Installation of Oil Burning Equipment in the U.S.

Always use latest editions of codes.

Note: Please carefully read this manual prior to attempting installation. Any warranty is null and void if these instructions are not followed. For information regarding other Viessmann System Technology componentry, please reference documentation of the respective product. We offer frequent installation and service seminars to familiarize our partners with our products. Please inquire.

All electrical wiring is to be done in accordance with the latest edition of CSA C22.1 Part 1 and/or local codes. In the U.S. use the National Electrical Code ANSI/NFPA 70. The heating contractor must also conform to the Standard for Controls and Safety Devices for Automatically Fired Boilers, ANSI/ASME CSD-1 where required by the authority having jurisdiction.

Working on the equipment

The installation, adjustment, service, and maintenance of this boiler must be performed by a licensed professional heating contractor who is qualified and experienced in the installation, service, and maintenance of hot water boilers. There are no user serviceable parts on the boiler, burners, or control.

Note: The completeness and functionality of field supplied electrical controls and components must be verified by the heating contractor. This includes low water cut-offs, flow switches (if used), staging controls, pumps, motorized valves, air vents, thermostats, etc.

Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Close main gas supply valve. Take precautions in all instances to avoid accidental activation of power during service work.

Mechanical room

Ensure the mechanical room complies with the requirements of the System Design Guidelines and/or Technical Data Manual. In addition, see section entitled “Mechanical Room” on page 10 in this manual.

Technical literature

Literature for the Vitorond 100 boiler:

- Technical Data Manual
- Installation Instructions
- Service Instructions
- Operating Instructions and User’s Information Manual
- Instructions of other Viessmann products utilized with this installation
- Hydrostat 3250-*Plus* instructions

Note: Leave all literature at the installation site and advise the system operator/ultimate owner where the literature can be found. Contact Viessmann for additional copies.
This product comes with several safety instruction labels attached. Do not remove! Contact Viessmann immediately if replacement labels are required.

About these Instructions

Take note of all symbols and notations intended to draw attention to potential hazards or important product information. These include "WARNING", "CAUTION", and "IMPORTANT". See below.

WARNING

Indicates an imminently hazardous situation which, if not avoided, could result in loss of life, serious injury or substantial product/property damage.

▶Warnings draw your attention to the presence of potential hazards or important product information.

CAUTION

Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or product/ property damage.

▶Cautions draw your attention to the presence of potential hazards or important product information.

IMPORTANT

▶Helpful hints for installation, operation or maintenance which pertain to the product.

▶

▶This symbol indicates that additional, pertinent information is to be found.

▶This symbol indicates that other instructions must be referenced.

Product Information

Sectional gray cast-iron boiler with triple-pass design. For operation in closed loop, forced circulation hot water heating systems. This boiler does not require a flow switch.
The boiler model size selected should be based on an accurate heat loss calculation of the building. The boiler selected must be compatible with the connected radiation.

Maximum adjustable high limit setting (Hydrostat 3250-*Plus*):.....190° F (88° C)
Fixed High limit Vitotronic 100 or 200 (factory set):.....230° F (110° C)
Adjustable High limit Vitotronic 100 or 200 (factory set):.....167° F (75° C)
Maximum allowable working pressure*1: ...45 psig (3 bar)
Fuel:.....#2 fuel oil

*1 Cast iron sections are ASME stamped for 58 psig (4 bar) and maximum allowable temperature of 250° F (121° C).

Supply/return bypass for large water content systems

For boilers connected to large water content systems (typically systems with volume > 1 USG (3.8 L) for every 13000 Btu/h of boiler input), such as a previous gravity system with large free-standing radiators, a bypass line from the supply pipe to the return pipe must be used to avoid flue gas condensation in the heat exchanger and the vent system. A bypass can be installed on any system as a preventative measure. Viessmann strongly recommends installing a bypass pipe on all cast iron boilers.

Hydrostat thermal targeting

Thermal Targeting technology analyzes thermostat activity and continually evaluates how much heat the house requires. When it is very cold outside, the heat demand is high and the Fuel Smart HydroStat will raise the boiler's Target temperature to provide needed heat to the home. When the outside temperature is milder, the heat demand is lower. During these periods, the Fuel Smart HydroStat will lower the boiler's Target temperature – saving fuel – while continuing to provide comfort to the house.

IMPORTANT

This boiler maybe equipped with an outdoor reset module (field supplied) that saves energy by reducing the boiler water temperature as the heating load decreases. This feature is equipped with an override which is provided primarily to permit the use of an external energy management system that serves the same function.

THIS OVERRIDE MUST NOT BE USED UNLESS AT LEAST ONE OF THE FOLLOWING CONDITIONS IS TRUE:

- **an external energy management system is installed that reduces the boiler water temperature as the heating load decreases.**
- **This boiler is not used for any space heating.**
- **This boiler is part of a modular or multiple boiler system having a total input of 300,000 BTU/hr or greater.**
- **This boiler is equipped with a tankless coil.**

Mechanical Room

During the early stages of new home design, we recommend that proper consideration be given to constructing a separate mechanical room dedicated to gas or oil fired equipment including domestic hot water storage tanks.

The boiler should be located in a heated indoor space, near a floor drain, and as close as possible to the vertical chimney or vent.

Install the boiler on a concrete foundation if:
- the floor may be flooded,
- the floor is not level,
- the boiler will be installed in a residential garage (in this case ensure that the burner is raised at least 18 in. (457 mm) above the floor to avoid contact with flammable vapors and fumes).

Viessmann strongly recommends installing the boiler on a concrete foundation.

Whenever possible install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area. In addition, do not use exhaust fans in the boiler room and do not install the boiler in rooms with refrigeration equipment. This equipment requires uncontaminated outside air for safe operation - do not install where chemicals are stored or in a room with negative pressure. See section entitled “Combustion Air Supply” for further details regarding the above.

Locate boiler on flooring capable of supporting the weight of the boiler filled with water. Ensure that the boiler location does not interfere with the proper circulation of combustion and ventilation air within the mechanical room.

Combustion Air Supply

⚠ WARNING

Failure to provide an adequate supply of fresh combustion air can cause poisonous flue gases to enter living space. Flue gases entering living space can cause carbon monoxide poisoning which can result in severe personal injury or loss of life.

⚠ WARNING

Never cover the boiler or store debris or other materials near the boiler, or in any way block the flow of adequate fresh air to the boiler. Never cover the combustion air opening.
Advise system operator/ultimate owner accordingly.

⚠ WARNING

The boiler must not be located in areas or rooms where chemicals are stored, or aggressive vapors (i.e. bleach, hair spray, methyl chloride, carbon tetrachloride or perchloroethylene) or high dust levels or humidity levels are present. Heat exchanger corrosion might occur and reduce the lifetime of the boiler significantly. If above criteria are not properly observed and boiler damage results, any warranty on the complete boiler and related components will be null and void.

General

This equipment requires fresh air for safe operation and must be installed ensuring provisions for adequate combustion and ventilation air exist.

Whenever possible, install boiler near an outside wall so that it is easy to duct fresh air directly to the boiler area.

The boiler location must never be under negative pressure. Exhaust fans, attic fans, or dryer fans may cause air to be exhausted at a rate higher than air can enter the structure for safe combustion.

The heating contractor shall ensure all of the following requirements are met:

- An adequate supply of combustion air must be available to ensure proper combustion.
- Ambient air temperatures must be maintained within safe operating limits.
- When a damper is provided in any opening intended to admit combustion air into the room within which the appliance is installed, the damper shall be interlocked to prevent any burner from starting before the damper is fully open.
- Each duct used to convey air from the outdoors shall have:
  1. A cross-sectional area throughout its length at least equal to the free area of the inlet and outlet openings which it connects,
  2. A minimum dimension of 3 in. (76 mm) at any cross-section,
  3. When making provision for outside combustion air, the intake shall not be less than 1 ft. (0.3 m) above the anticipated snow level for the location.
- The heating contractor must check with local authorities (municipal building department, gas utility) for combustion air requirements particular to the area.

Combustion Air Supply *(continued)*

Codes

Provisions for combustion and ventilation air must be made in accordance with applicable local codes.
In the absence of local codes, use:

- CSA B-139.00 for oil installations in Canada, or
- NFPA 31, Standard for the Installation of Oil Burning Equipment in the U.S. Always use latest editions of codes.

Unconfined spaces

Where the boiler is located in an unconfined space in a building having insufficient infiltration, additional air for combustion and ventilation shall be obtained from outdoors or from spaces freely communicating with the outdoors. Under these conditions, permanent opening(s) shall be provided so that the total air received through these openings will be at least as much as would be admitted by openings having a total free area of 1 in^2/5000 Btu/h or 4.5 cm^2/kWh of the total input rating of all oil-fired appliances

Louvers and grilles

In calculating free area as specified, consideration shall be given to the blocking effect of louvers, grilles, or screens that protect openings. Screens used shall be no smaller than ¼ in. (6 mm) mesh and shall be readily accessible for cleaning. If the free area through a design of louver or grille is known, it shall be used in calculating the size of opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvres have 20-25% free area and metal louvres and grills have 60-75% free area.

Installation

Install a combustion air opening. Round duct diameters are as follows:

Boiler Model No.		**VR1 -22**	**VR1 -27**	**VR1 -33**
Round duct for combustion air supply *1	Ø"	5	5	6

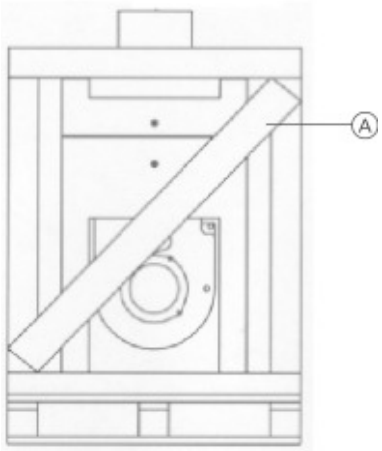
Confined spaces

If the boiler is located in a confined space and obtains all of its air for combustion and ventilation from within the conditioned space, the building shall be provided with two permanent openings, one near the top of the enclosure and another near the bottom. Each opening shall have a free area of not less than 1 in^2/1000 Btu/h or 19.5 cm^2/kWh of the total input rating of all appliances in the enclosure, freely communicating with interior areas that have in turn adequate infiltration from the outside.

If the boiler is located in a confined space and that obtains all of its air for combustion and ventilation from outside, the building shall be provided with two permanent openings, one near the top of the enclosure and another near the bottom. Each opening shall communicate directly or by means of ducts with the outdoors or to such spaces (such as a crawl space) that freely communicate with the outdoors, and shall be sized in accordance with the following methods:

- Vertical duct(s) with a free area of not less than 1 in^2/4000 Btu/h or 5.5 cm^2/kWh of the total input rating of all appliances in the enclosure,
- Horizontal duct(s) with an equivalent length of less than 50 ft (15 m), having a free area of not less than 1 in^2/2000 Btu/h or 11 cm^2/kWh of the total input of all appliances in the enclosure,
- Air openings that communicate directly with the outdoors, having a free area of not less than 1 in^2/4000 Btu/h or 5.5 cm^2/kWh of the total input rating of all appliances in the enclosure.

Product Delivery



Vitorond boilers size VR1-22 to VR1-33 are shipped in a crate with separate boiler jacketry.

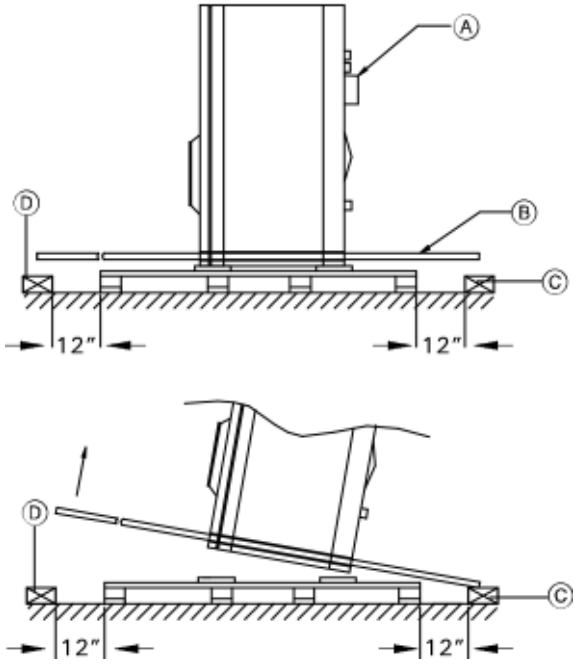
Product delivery
Ensure each of the following has been delivered:

- Crate with boiler Ⓐ
- Carton with burner (shipped separately)
- Carton with standard installation equipment

Unpacking Instructions

⚠ WARNING

To avoid injury and to facilitate boiler maneuvering, it is strongly recommended that Viessmann carrying handles (Part No. 7189 602) be used. The carrying handles allow easy removal of boiler from skid and enables easy transportation to permanent location, while reducing the risk of boiler panel damage due to improper lifting or maneuvering techniques. The carrying handles are designed to prevent boiler slippage onto hand when carrying up/down inclines.



Legend
Ⓐ Casting
Ⓑ 1″ pipe, x2
Ⓒ Rear wooden block
Ⓓ Front wooden block

⚠ CAUTION

Do not lift or position boiler alone.
Do not lift by or push against panels.
Do not bump boiler panels against floor.
Do not drop boiler.

⚠ CAUTION

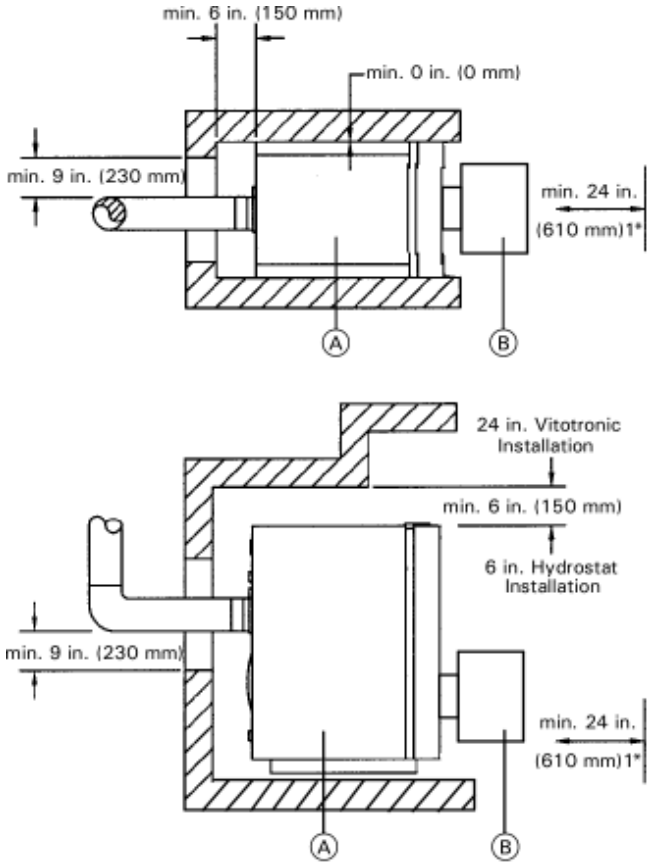
To avoid injury to hands, place wooden block under pipes in front of skid.

If carrying handles are not available, follow the steps below.

1. Remove top and sides of crate.
   To avoid damage during lifting, carefully remove front panel by lifting panel up and out.
2. Place wooden block 12″ from rear of skid.
3. Insert 1″ Ø Schedule 40 pipes through openings in casting legs. Ends of pipes should be centered on wooden block behind skid.
4. Lift boiler using pipes until clear from skid. Remove skid from beneath boiler.
5. Lower boiler until pipes rest on front block.
6. To remove rear block, lift (by casting - not jacket) to tilt unit forward.
   To remove front block, lift (by casting - not jacket) to tilt unit backward.
7. Remove pipes. Reinstall front boiler panel once boiler is in final position.

5583 571 - 01

Minimum Clearances to Combustibles



*1 Clearance of 24" (610 mm) required . for burner service.

Legend
Ⓐ Boiler
Ⓑ Burner

For typical installations, Viessmann recommends installing the boiler with clearances as shown in Recommended Minimum Clearances for Service.

The following are clearances to combustibles:

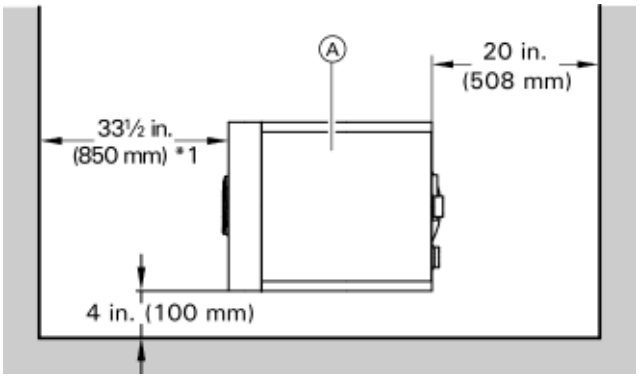
Standard installation

Boiler model	VR1	-22	-27	-33
Rear	in.	6	6	6
	(mm)	(150)	(150)	(150)
Sides	in.	0	0	0
	(mm)	0	0	0
Flue	in.	9	9	9
	(mm)	(230)	(230)	(230)
Floor	Combustibles			

Alcove installation

Boiler model	VR1	-22	-27	-33
Rear	in.	6	6	6
	(mm)	(150)	(150)	(150)
Sides	in.	0	0	0
	(mm)	0	0	0
Flue	in.	9	9	9
	(mm)	(230)	(230)	(230)
Top	in.	6	6	6
	(mm)	(150)	(150)	(150)
Floor	Combustibles			

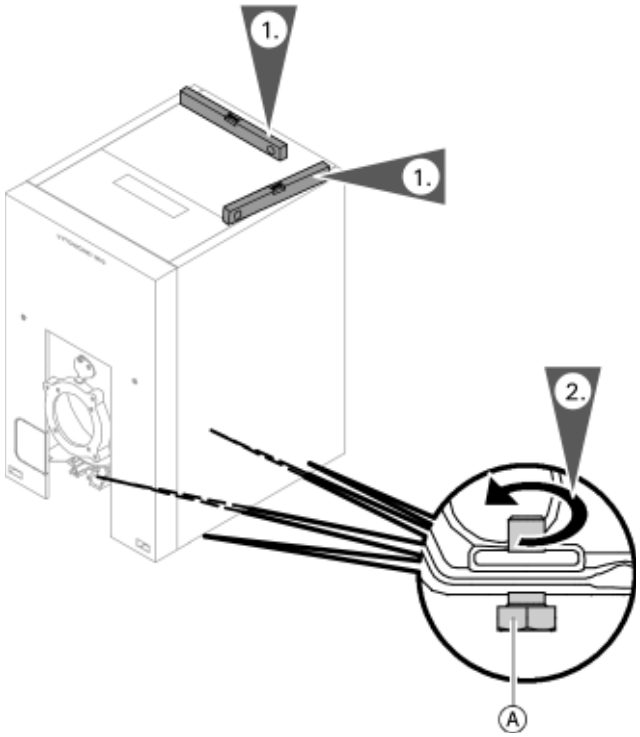
Recommended Minimum Clearances for Service



*1 Minimum access for cleaning and service.

Legend
Ⓐ Boiler

Boiler Set-up and Location



IMPORTANT

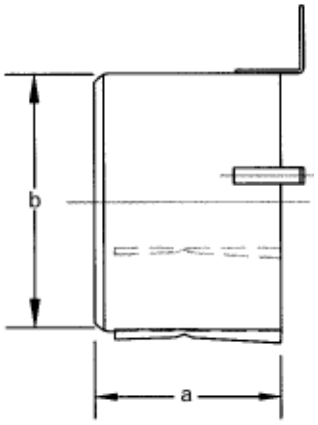
For important information concerning boiler placement and set-up, refer to the section entitled "Mechanical Room" on page 10.

The boiler should be located as close to the chimney as possible. Set-up/locate boiler with slight incline towards the rear of the boiler using levelling bolts Ⓐ.

CAUTION

Boiler must be installed in such a way that oil ignition system components are protected from water (spraying, splashing, etc) during boiler system operation and service.

Combustion Chamber Insert



For optimum, environmentally sound operation, Vitorond boilers are equipped with a high-grade, corrosion resistant, stainless steel combustion chamber insert.

Ensure the bolts of the combustion chamber door are tightened before installing the burner.

Combustion chamber insert sizes

Boiler model No.		VR1-22	VR1-27	VR1-33
a	in.	9⅝	9⅝	9⅝
	(mm)	(244)	(244)	(244)
b	in.	9	9	9
	(mm)	(231)	(231)	(231)

Venting Connection

Vitorond 100
The vent system must comply with all applicable local and/or national codes.
If installing boiler with a side wall vent system, ensure all manufacturer's requirements are met.

Venting codes
For oil-fired boilers install venting system in accordance with all applicable local codes:. In the absence of local codes, follow national codes
- Local codes or CSA B139-00 in Canada,

or
- NFPA-31 in the U.S.

Building codes
Masonry or concrete or metal chimneys (smokestacks) shall be constructed according to the requirements of the province/state building code or, in the absence of such regulations, in accordance with:
- CSA Standard CAN/CSA-A405 (National Building Code of Canada) in Canada, or
- NFPA 211 (Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances) in the US. Metal chimneys also shall meet the requirements of Chapter 4 of NFPA 211.

In Canada, factory built chimneys shall:
- Conform to ULC Standards CAN/ULC-S629 for 1202° F (650° C), CAN/ULC-S604 for Type A, or CAN/ULC-S609 for Type L chimneys,
- Be certified and installed in accordance with the manufacturer's certified instructions, and
- Be provided with a clean-out opening that is equipped with a tight-fitting removable cap, and constructed so that no air can enter the clean-out facility when the cap is in place.

In the U.S., factory built chimneys shall:
- Meet the requirements of NFPA, and
- Be listed, installed and used in accordance with their listings and manufacturer's instructions.

⚠ WARNING

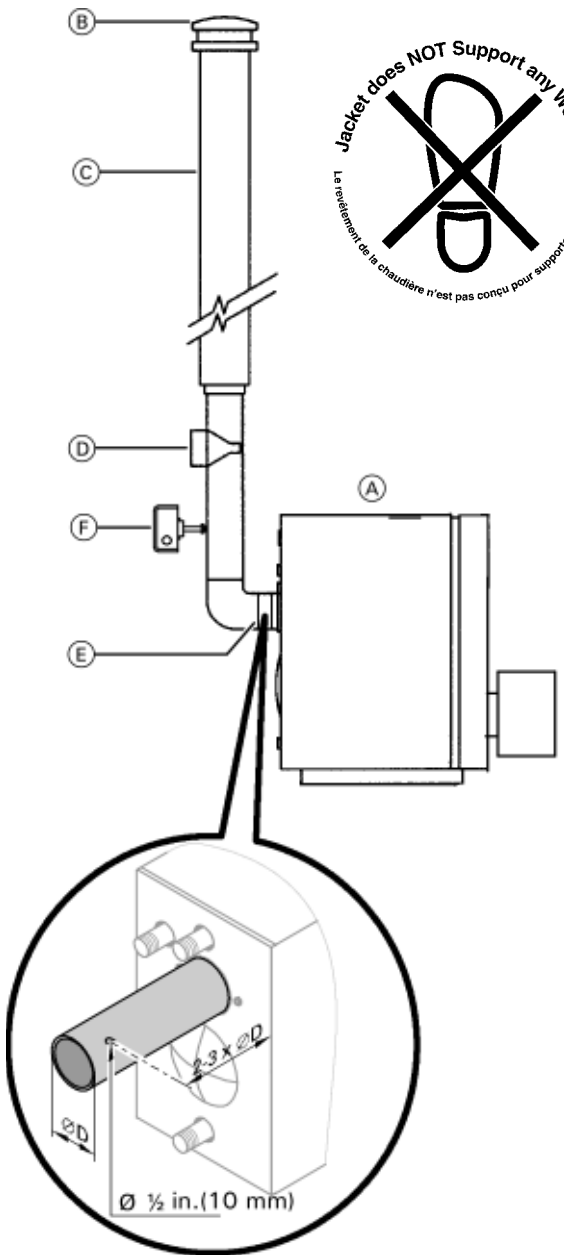
Improper sizing, maintenance, termination of vent or chimney can cause flue gases to enter living space. Any blockage of vent or chimney by birds' nests, ice, snow, debris, or other materials can cause flue gases to enter living space. Flue gases entering living space can cause carbon monoxide poisoning which can result in severe personal injury or loss of life.

General
The heating contractor shall ensure all of the following requirements are met:
- The vent system shall ensure that no hazard is created by the products of combustion.
- Provision shall be made to vent the products of combustion safely to outside the building, and such venting shall not pass through or be installed in return air, supply air, ventilating, or combustion air ducts or shafts.
- Sufficient air for combustion of the oil and ventilation of the appliance shall be supplied to the space wherein the appliance is located (see section entitled Combustion Air Supply).
- The house and its mechanical systems shall be inspected to determine if operation of exhaust devices could lead to levels of depressurization of the house that would adversely affect the operation of the oil-burning appliance and its venting system. If such is the case, the building owner shall be informed of the situation in writing.
- The chimney shall be inspected to ensure that the material construction, condition, and size are suitable for the application.
- This boiler/burner combination shall not be connected to an unlined chimney. Such chimneys shall be lined in accordance with the applicable codes and standards.
- The chimney shall be capable of exhausting the products of combustion and of producing a draft not less than that recommended by the manufacturer of the appliance connected thereto, during the mildest weather conditions under which the appliance is expected to operate.
  During cold weather testing, excess flow performance shall be demonstrated to ensure that flow is adequate in warmer weather.
- An oil burning appliance that depends on natural chimney draft shall be connected to an individual chimney vent used for no other appliance, except as permitted by the applicable codes and standards.
- The vent connector of this boiler must not be connected into any portion of mechanical draft systems operating under positive pressure.
- A chimney flue shall extend at least 3 ft (1 m) above the highest point at which the chimney comes in contact with the roof, and not less than 2 ft (0.6 m) above the highest roof surface or structure within 10 ft. (3 m) of the chimney on a horizontal plane perpendicular to the chimney. Not more than 8" (200 mm) of chimney flue above the top of the chimney cap shall be considered in computing height.
- Down draft and condensation problems must be corrected.

⚠ WARNING

Never operate the boiler/burner without an installed venting system which safely vents all products of combustion to the outdoors. The vent system must comply with all applicable local and/or national codes.

Venting Connection *(continued)*



When installing piping or venting, or while insulating overhead pipes, do not stand on top panel of boiler. Advise other trades accordingly!

Installation

Use approved vent material only.

1. Install the venting so as to achieve the shortest possible way with minimum elbows. If necessary, rearrange existing water piping to achieve closest chimney connection.
2. Horizontal runs must be supported by appropriate means to prevent sagging. Avoid long horizontal runs of vent pipe. Horizontal runs should have not less than ¼" rise per ft. from the boiler to the vent terminal. Metal strapping must be used to support horizontal runs every 4 ft. (1.2 m)
3. Connect factory supplied vent pipe adaptor Ⓔ to flue gas collar. Fasten using either three equally spaced,corrosion resistant, self-tapping screws and high temperature silicone, or equivalent means.
4. Connect chimney via a 18" (457 mm) long field supplied, slightly inclined intermediate section of venting. Flue pipe outside ∅: 5".
5. Drill a ½" opening on the side of the vent pipe approximately three times the vent pipe diameter away from the flue gas collar of the boiler for flue gas analysis equipment.
6. Seal all flue pipe joints.
7. Viessmann recommends that any non-insulated vent pipe is insulated to reduce cooling of flue gas and velocity noises.

For direct vent application, refer to the Direct Vent System Installation Instructions

Legend

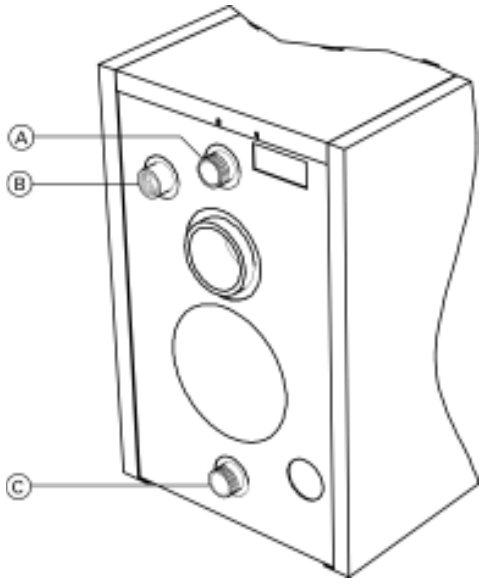
Ⓐ Vitorond boiler with burner
Ⓑ Outside rain cap
Ⓒ Vent, use approved vent material
Ⓓ M-Barometric damper (field supplied) for oil *1
Ⓔ Vent pipe adaptor (factory supplied)
Ⓕ For Canada: Blocked vent safety switch

Installation Instructions
Blocked Vent Safety Switch

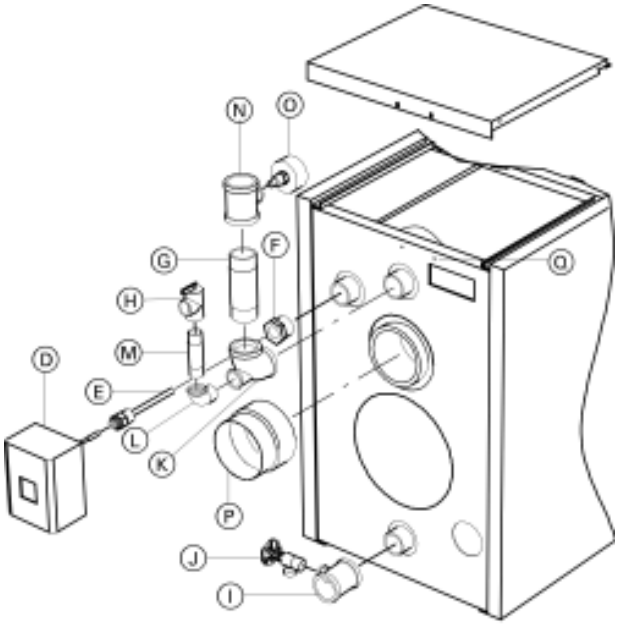
*1 Install in accordance with the draft control manufacturer's instructions.

5583 571 - 01

Water Side Connections (with Hydrostat 3250-*Plus* Control)



Legend
Ⓐ Boiler water supply connection, pressure relief valve:.....1½" NPT
Ⓑ High limit control location:.....1¼" NPTF
Ⓒ Boiler water return, drain and automatic feed:.1½" NPT



Legend
Ⓓ Hydrostat control 3250 *Plus*
Ⓔ Electro-well
Ⓕ Hex bushing, 1½" x ¾"
Ⓖ Nipple, 1½" x 5"
Ⓗ Pressure relief valve
Ⓘ Tee, 1½" x 1½" x ¾"
Ⓙ Drain valve (sediment faucet), ¾"
Ⓚ Reducing tee/elbow, 1½" x ¾" x 1½"
Ⓛ Street elbow, ¾"
Ⓜ Nipple, ¾" x 3½"
Ⓝ Reducing tee, 1½" x 1½" x ½"
Ⓞ Temperature and pressure gage
Ⓟ Flue gas adaptor, Ø 5"

IMPORTANT

This boiler is designed for closed loop, forced circulation heating systems only.

1. Flush heating system thoroughly (particularly with existing systems which have been in operation for years).

⚠ WARNING

Failure to flush the heating system could cause system sludge to settle in the boiler, causing overheating and failure. This type of failure is not covered under warranty.

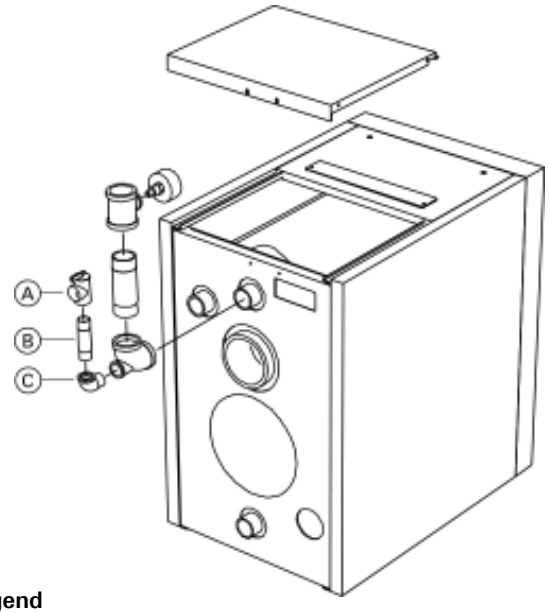
IMPORTANT

We recommend the installation of a spring-loaded flow-check valve in heating circuits without mixing valves. This serves to avoid uncontrolled gravity circulation of heat into the heating system during summer months.

2. Remove screw Ⓠ. Remove top back panel before starting to connect pipe fittings to boiler water supply connection.
3. Connect system supply Ⓐ to using NPT fittings, as shown in the illustration. Connect the system return Ⓒ to using NPT fittings, as shown. See installation examples in the following section starting on page 50.
4. Install temperature and pressure gage Ⓞ with brass extension coupling in ½" opening as shown in the illustration. Use thread sealing compound such as Loctite or Teflon tape.

Hydrostat control is equipped with a remote mounting kit (c/w a 48" sensor cable) for easy installation of the control in a convenient location.

Safety Connections (with Hydrostat 3250-*Plus* Control)



Legend
Ⓐ Pressure relief valve
Ⓑ Nipple, ¾″ x 3½″
Ⓒ Tee, 1½″ x ¾″ x 1½″

Pressure relief valve

1. Install pressure relief valve. Pipe pressure relief valve as illustrated and connect to boiler water supply connection.

   Refer to instructions supplied with the pressure relief valve.

2. Install discharge pipe on pressure relief valve.
   The discharge pipe should terminate approximately 6″ (150 mm) above a floor drain.
   The end of the pipe must not be threaded.

Minimum connection diameters:
Pressure relief valve..... ¾″
Discharge pipe..... ¾″
Piping to precharged expansion tank
VR1-22 to VR1-33..... ¾″

This boiler does not require a flow switch.

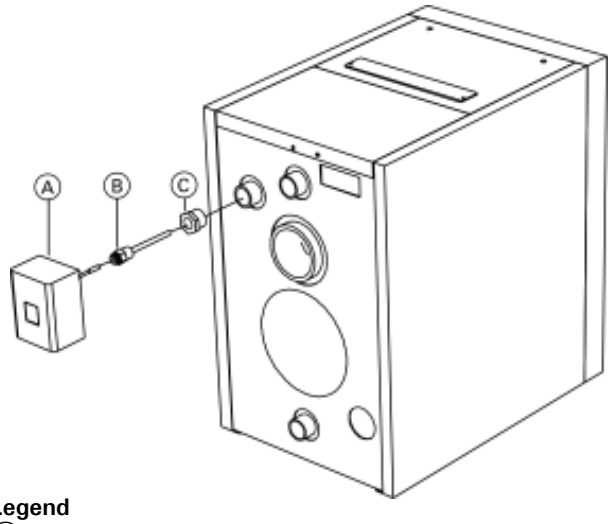
IMPORTANT

Install the (approved) factory supplied pressure relief valve.

Removal of air from the system must occur via use of air vent(s) in the system supply. To ensure the boiler can be purged of all air, ensure supply/return water lines do not contain restrictive piping where air could be trapped.

⚠ WARNING

Do not install an isolation valve between boiler and pressure relief valve.
The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants. Pipe pressure relief valve discharge pipe close to floor drain. Never pipe discharge pipe to the outdoors.



Legend
Ⓐ Hydrostat 3250-*Plus* high limit control
Ⓑ Electro-well
Ⓒ Hex bushing

Boiler control

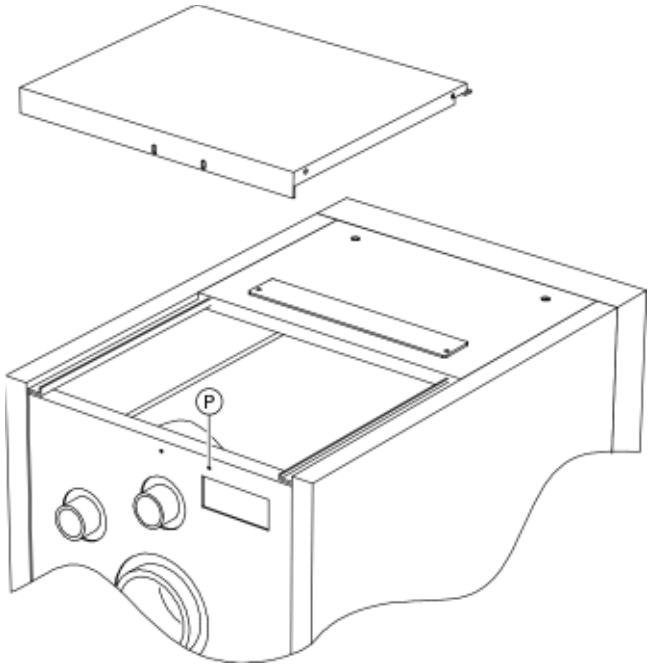
1. Install supplied high limit control as shown.

Maximum allowable temperature setting is 240°F (110°C).

Refer to instructions supplied with the Hydrostat 3250-*Plus* control.

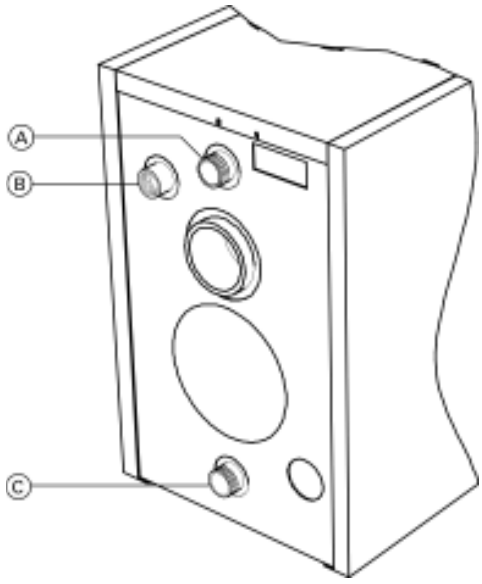
5583 571 - 01

Safety Connections (with Hydrostat 3250-*Plus* Control) *(continued)*



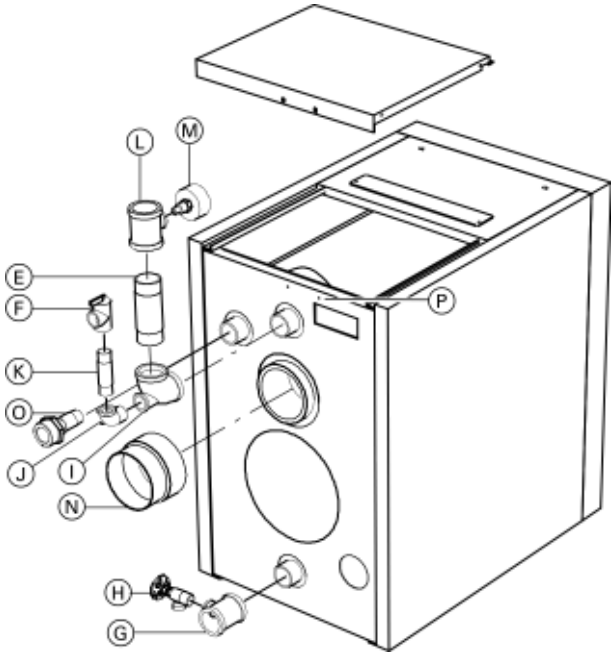
1. To avoid problems with removing the top panel, we recommend moving the top panel screw approximately 3" to the left or right. To do so, pre-drill the panel with an ⅛" drill bit.
   To reinstall the top panel, drill a new ⅛" pilot hole through the top back panel and into the back panel. Reinstall the screw Ⓟ into this new mounting hole.

Water Side Connections (Vitotronic Control)



Legend

Ⓐ Boiler water supply connection, pressure relief valve.....1½" NPT
Ⓑ Boiler water return with return injector nozzle .....1½" NPT
Ⓒ Safety return; connect precharged expansion tank, boiler drain, and automatic feed .....1½" NPT



Legend

Ⓔ Nipple, 1½" x 5"
Ⓕ Pressure relief valve
Ⓖ Tee, 1½" x 1½" x ¾"
Ⓗ Drain valve (sediment faucet), ¾"
Ⓘ Reducing tee/elbow, 1½" x ¾" x 1½"
Ⓙ Street elbow, ¾"
Ⓚ Nipple, ¾" x 3½"
Ⓛ Reducing tee, 1½" x 1½" x ½"
Ⓜ Temperature and pressure gage
Ⓝ Flue gas adaptor, Ø 5"
Ⓞ Return injector

IMPORTANT

This boiler is designed for closed loop, forced circulation heating systems only.

1. Flush heating system thoroughly (particularly with existing systems which have been in operation for years).

CAUTION

Failure to flush the heating system could cause system sludge to settle in the boiler, causing overheating and failure. This type of failure is not covered under warranty.

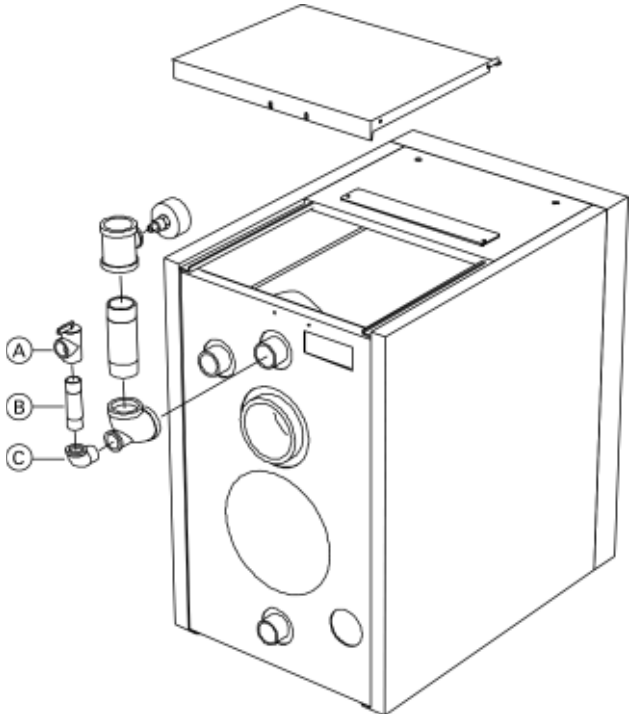
IMPORTANT

We recommend the installation of a spring-loaded flow-check valve in heating circuits without mixing valves. This serves to avoid uncontrolled gravity circulation of heat into the heating system during summer months.

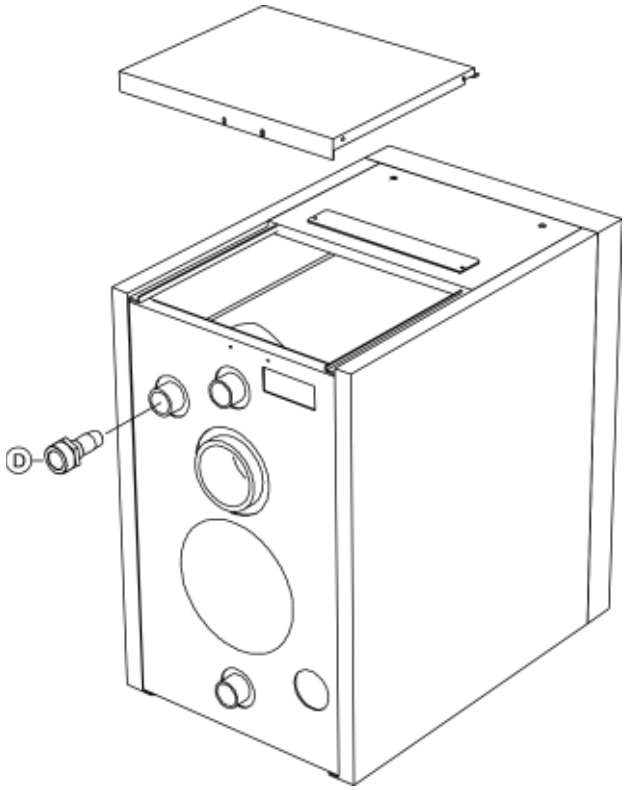
2. Remove screw Ⓟ. Remove top back panel before starting to connect pipe fittings to boiler water supply connection.
3. Connect system supply to Ⓐ using NPT fittings. Connect the system return to Ⓑ using NPT fittings pictured below. See installation examples.
4. Install temperature and pressure gage with brass extension coupling Ⓜ in ½" opening as shown in the illustration. Use thread sealing compound such as Loctite or Teflon tape.

5583 571 - 01

Safety Connections (Vitotronic Control)



Legend
Ⓐ Pressure relief valve
Ⓑ Nipple, ¾" x 3½"
Ⓒ Tee, 1½" x ¾" x 1½"



Pressure relief valve

1. Install pressure relief valve. Pipe pressure relief valve as illustrated and connect to boiler water supply connection.

   Refer to instructions supplied with the pressure relief valve.

2. Install discharge pipe on pressure relief valve. The discharge pipe should terminate approximately 6 in. (150 mm) above a floor drain. The end of the pipe must not be threaded.

Minimum connection diameters:
Pressure relief valve ..... ¾"
Discharge pipe ..... ¾"

This boiler does not require a flow switch.

IMPORTANT

Install the (approved) factory supplied pressure relief valve. Removal of air from the system must occur via use of air vent(s) in the system supply. To ensure the boiler can be purged of all air, ensure supply/return water lines do not contain restrictive piping where air could be trapped.

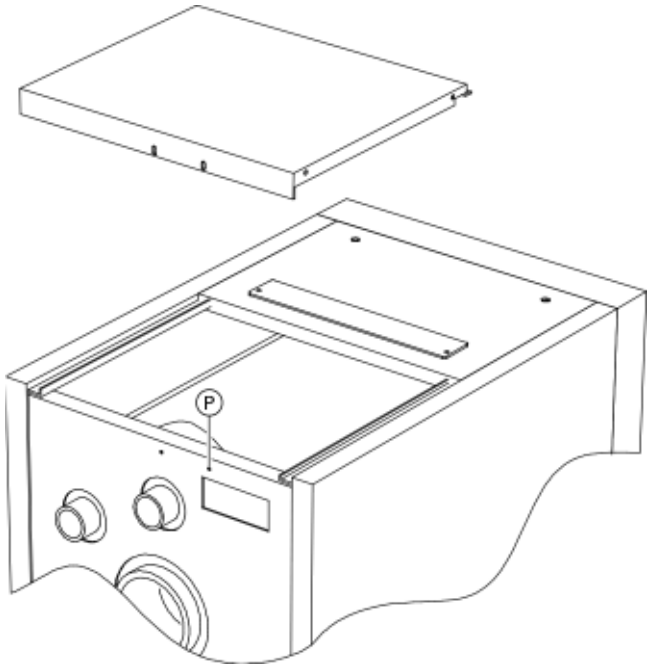
⚠ WARNING

Do not install an isolation valve between boiler and pressure relief valve.
The discharge pipe for the pressure relief valve must be oriented to prevent scalding of attendants. Pipe pressure relief valve discharge pipe close to floor drain. Never pipe discharge pipe to the outdoors.

Boiler return injector

1. Install bushing/return water injector combination Ⓓ.

Safety Connections (Vitotronic Control) *(continued)*



1. To avoid problems with removing the top panel, we recommend moving the top panel screw approximately 3" to the left or right. To do so, pre-drill the panel with an ⅛" drill bit.
   To reinstall the top panel, drill a new ⅛" pilot hole through the top back panel and into the back panel. Reinstall the screw Ⓟ into this new mounting hole.

Pressure Testing

Perform pressure test on boiler

The boiler must be leak tested before being placed in operation. Before boiler is connected to piping or electrical power supply, it must be hydrostatically pressure tested with a maximum of 1½ times the maximum operating pressure of the boiler.

1. After installing safety devices (above), install temporary cap on ¾" nipple extension (nipple for pressure relief valve mounting).
2. Cap supply and return connections.
3. Connect ½" garden hose to boiler drain valve and fill boiler slowly until pressure gage indicates max. 68 psi (4.65 bar).

⚠ WARNING

Exposing the boiler to pressures and temperatures in excess of those listed will result in damage and will render warranty null and void.

4. Maintain pressure for 15 minutes. During time of pressure testing, do not leave boiler unattended.
5. Inspect all pipe joint connections, the safety devices (Safety Header, if applicable), and boiler base with flashlight for leaks.
6. After 15 minutes, release water pressure from boiler by opening boiler drain valve slowly, remove caps from supply and return connections as well as ¾" cap from safety nipple, and install pressure relief valve immediately instead of ¾" cap. After boiler has passed pressure test, proceed with installation.

Max. allowable operating pressure.....45 psig (3bar)
Max. allowable testing pressure.....68 psig (4.65 bar)
Max. allowable boiler temperature.....248° F (120° C)

Burner Installation

Refer to instructions supplied with the Beckett burner.

Observe all instructions supplied with the burner.

Burner Information

Fuel
This boiler is for use with the Beckett #2 fuel oil burner supplied by Viessmann only. Use only the fuel stated on the rating plate of the burner.

WARNING

DO NOT USE GASOLINE CRANKCASE DRAININGS OR ANY OIL CONTAINING GASOLINE.

Oil nozzle
The Beckett burner for the VR1-63 boiler is shipped with factory setting and oil nozzle installed. For VR1-50 boiler, replace installed nozzle with nozzle packaged with burner. For Beckett burner specifications see table on page 47.

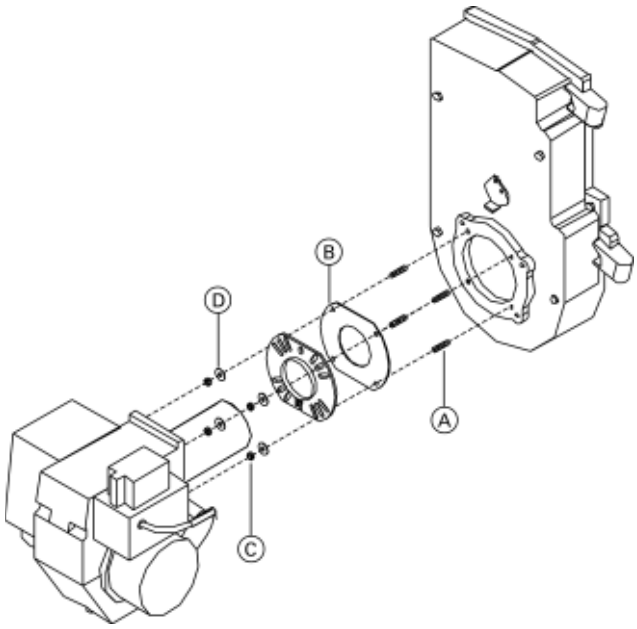
Burner calibration
Ensure that the combustion results of the oil-fired burner mounted on this boiler are verified after start-up.
If adjustments are necessary, always verify results with a calibrated flue gas analyzer.

For Beckett burner specifications see table on page 47.

IMPORTANT

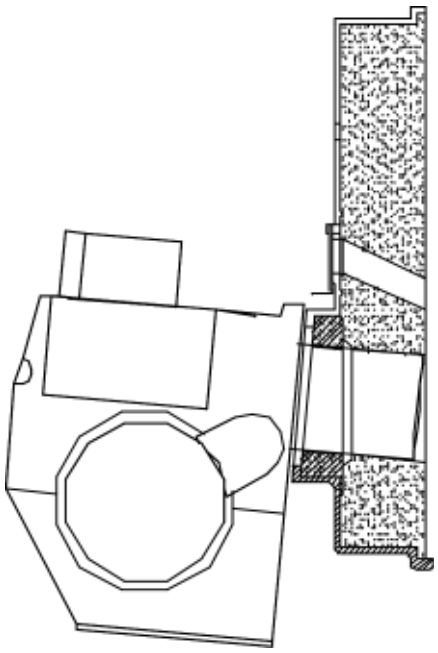
This burner is shipped with the oil pump set to operate on a single line system. To operate on a two-line system, the bypass plug must be installed. The burner is shipped configured for use in single line applications. No changes to the oil pump are required for use in single line applications.

Burner Mounting



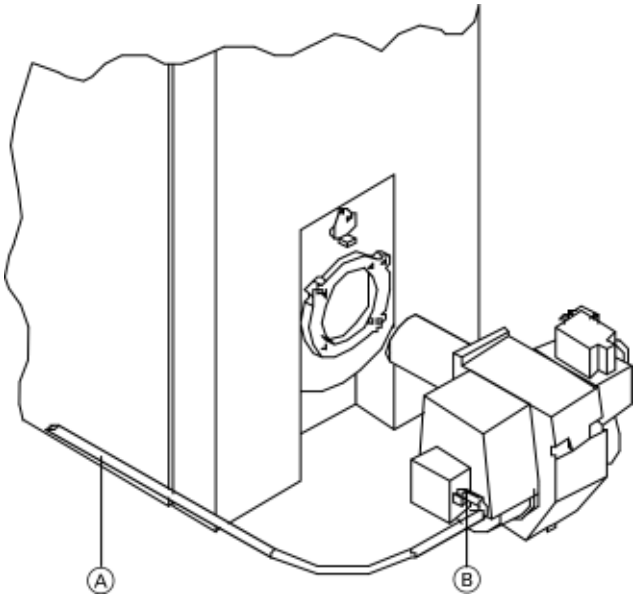
Refer to instructions supplied with the Beckett burner.

1. Remove burner from carton. The mounting flange has been installed at the factory.
2. Mount four M8 spacer bolts Ⓐ in threaded holes of combustion chamber door.
3. Slide burner gasket Ⓑ over spacer bolts.
4. Mount burner as shown. (For proper insertion lengths see table on page 47).
5. Secure burner with M8 nuts Ⓒ and washers Ⓓ provided.



Burner air tube insertion

Oil Piping Connection



Legend
Ⓐ Oil line (see local codes for appropriate arrangement and piping of filter control valves, etc., back to oil tank)
Ⓑ Flare fitting

IMPORTANT

This burner is shipped with the oil pump set to operate on a single line system. To operate on a two-line system, the bypass plug must be installed. The burner is shipped configured for use in single line applications. No changes to the oil pump are required for use in single line applications.

General Oil piping requirements

Location and installation of oil tanks, oil piping and burners must follow:
- Local codes and regulations.
- Information provided with burner and fuel pump.
- In Canada, CSA B139.00, Installation of Oil-Burning Equipment.
- In USA, NFPA 31, Standard for the Installation of Oil-Burning Equipment.

⚠ WARNING

Do not use Teflon tape as an oil pipe sealant. It can cause valves to fail, creating hazards. Do not use compression fittings.

Underground oil line piping must be encased to prevent oil leaking into ground. Check local codes for information. If any part of fuel oil tank is above burner level, an anti-siphon device must be used to prevent flow of oil in case of oil line break.

Make tank connections with swing joints or copper tubing to prevent breaking in case the tank settles. Make swing joints so they will tighten as tank settles. Non-hardening pipe joint compounds should be used on all threads.

Support oil lines as required by codes.

Oil piping connection at burner

See illustration above for recommended connection at burner, allowing burner mounting door to swing open completely for servicing.

⚠ WARNING

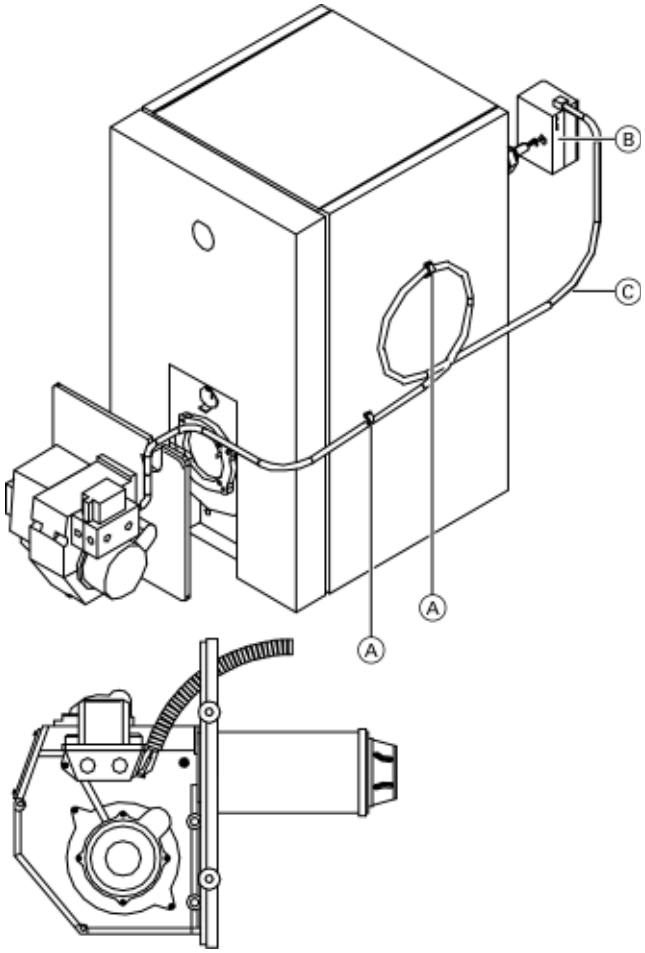
The oil supply inlet pressure to the fuel unit cannot exceed 3 psig. Install a pressure-limiting device in accordance with the above mentioned codes.

5583 571 - 01

Electrical Connections (with Hydrostat 3250-*Plus* control)

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.



Legend
Ⓐ Cable strap (supplied)
Ⓑ Hydrostat 3250-*Plus*
Ⓒ Burner wiring harness (supplied)

WARNING

Ensure that burner wiring harness is properly attached and secured to the boiler side panel using the supplied cable straps as depicted above. The cable strap must be coiled on the boiler side panel so that no slack is left, allowing the burner/boiler door to be swung open without disconnecting the burner wiring harness from the burner. Failure to heed this warning may result in personal injury.

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any additional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

- All field supplied nominal 120 VAC voltage wiring must be sheathed in a flexible metal conduit.
- Disconnect means, overload protection and low water cut-off must be provided as required by local codes.
- Connect incoming line voltage HOT (L1) wire to terminal L1, and N to terminal L2 of the Hydrostat 3250-*Plus* control (see wiring diagram on page 29).

Burner wiring (Beckett)

IMPORTANT

The R7184 or GeniSys 7505P primary control with valve-on delay (pre-purge) and burner motor-off delay (post-purge - factory default settings can be field adjusted), requires a constant 120 VAC power source supplied to the BLACK wire on the control (see wiring diagram on pages 29).

1. The cover mounting plate is not a conduit connection point. Pass conduit and attached connector through the front opening in the mounting plate or through one of the knockouts on either side of the cover and attach it directly to the burner-mounted 4x4 electrical junction box.

Room thermostat wiring

1. Install thermostat on inside wall away from influences of drafts, hot or cold water pipes, lighting fixtures, television, sun rays or fireplaces.

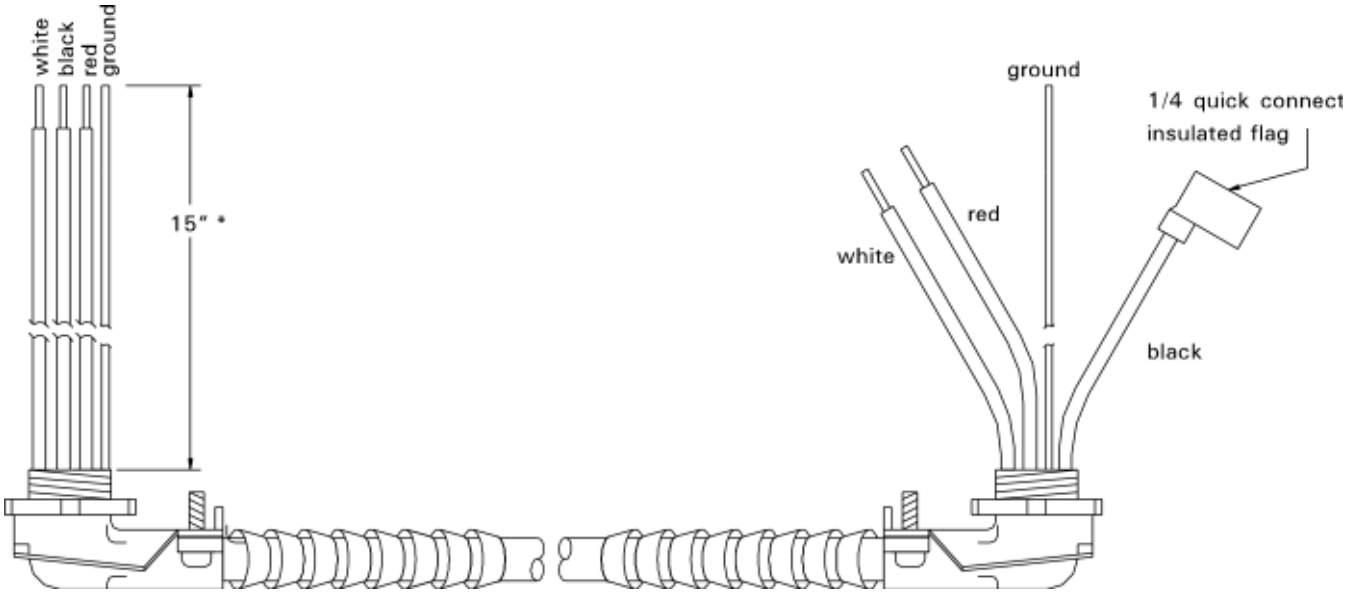
2. Follow instructions supplied with room thermostat. If it has a heat anticipator, set heat anticipator in thermostat to match power requirements of equipment connected to it. Boiler wiring diagrams give setting for standard equipment.

Electrical Connections (with Hydrostat 3250-*Plus* control) *(continued)*

⚠ WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

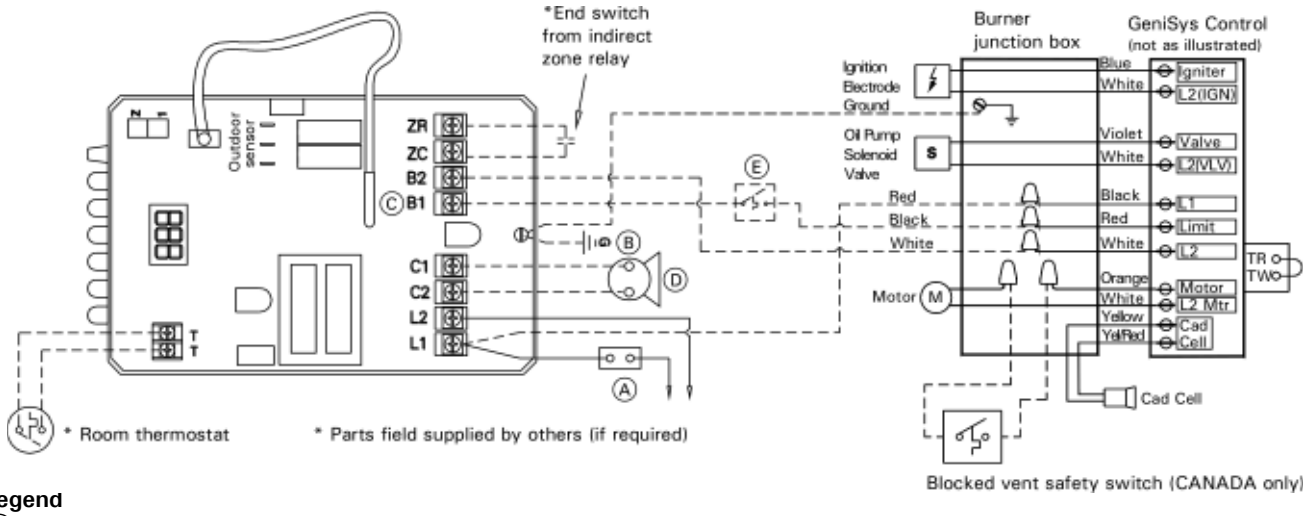


Burner wiring harness (supplied)

* If Beckett burner is being installed, cut this length to 6" for connection to burner junction box (located under the burner primary control).

5583 571 - 01

Electrical Connections (with Hydrostat 3250-*Plus* control) *(continued)*



Legend

Ⓐ Power supply, provide disconnect means and overload protection as required.
Ⓑ Control case must be connected to earth ground. Use grounding provided.
Ⓒ B1 is ¼ in. tab terminal.
Ⓓ Circulator
Ⓔ Temperature limit control (when required by local jurisdiction)

⚠ WARNING

Ensure that the burner cycles ON and OFF on proper call for heat before leaving the job site. Failure to do so may lead to boiler runaway situation, which may lead to property damage, personal injury or death.

⚠ CAUTION

A field supplied manual reset high limit control must be installed at the outlet pipe of the boiler to interrupt burner operation should the factory supplied high limit control fail. This field supplied high limit control must be set 20°F (7°C) above the setting of the factory supplied high limit control. The setting of this field supplied high limit control must never be greater than 220°F (104°C).

Note: Used with standard venting and direct vent systems.

Installations must follow these codes and requirements:

- National Electrical Code, ANSI/NFPA 70, latest edition and any additional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

⚠ WARNING

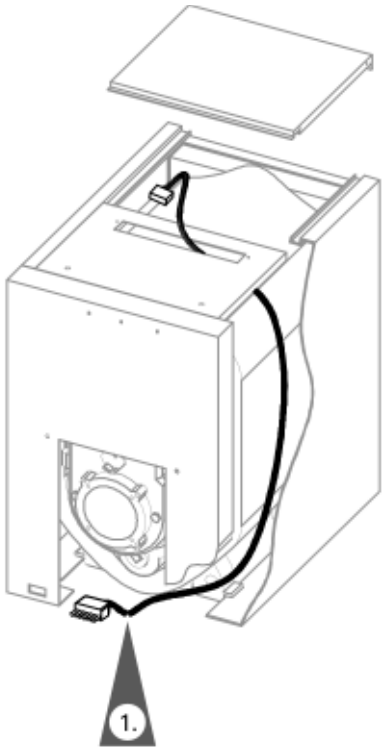
Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

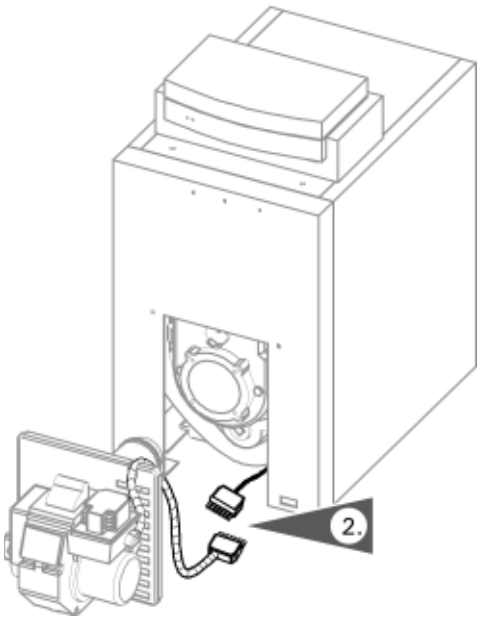
- All field supplied nominal 120 VAC voltage wiring must be sheathed in a flexible metal conduit.
- Disconnect means, overload protection and low water cut-off must be provided as required by local codes.
- Connect incoming line voltage HOT (L1) wire to terminal L1, and N to terminal L2 of the Hydrostat 3250-*Plus* control (see wiring diagram).

Electrical Connections (with Vitotronic control)

⚠ WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.





Installations must follow these codes and requirements:

- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

Burner wiring

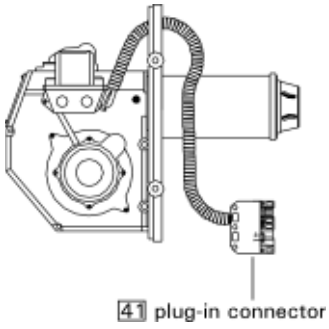
IMPORTANT

The R7184 or GeniSys 7505P primary control with valve-on delay (pre-purge) and burner motor-off delay (post-purge - factory default settings can be field adjusted), requires a constant 120 VAC power source supplied to the BLACK wire on the control (see wiring diagram on page 34).

1. The cover mounting plate is not a conduit connection point. Pass conduit and attached connector through the front opening in the mounting plate or through one of the knockouts on either side of the cover and attach it directly to the burner-mounted 4x4 electrical junction box.

Electrical connections

1. Run the 41 plug-in connector cable of the Vitotronic control down behind the front panel of the boiler and out through the bottom.
2. Connect the female 41 plug of the burner to the male 41 plug of the Vitotronic control.



Room thermostat wiring

1. Install thermostat on inside wall away from influences of drafts, hot or cold water pipes, lighting fixtures, television, sun rays or fireplaces.

2. Follow instructions supplied with room thermostat. If it has a heat anticipator, set heat anticipator in thermostat to match power requirements of equipment connected to it. Boiler wiring diagrams give setting for standard equipment.

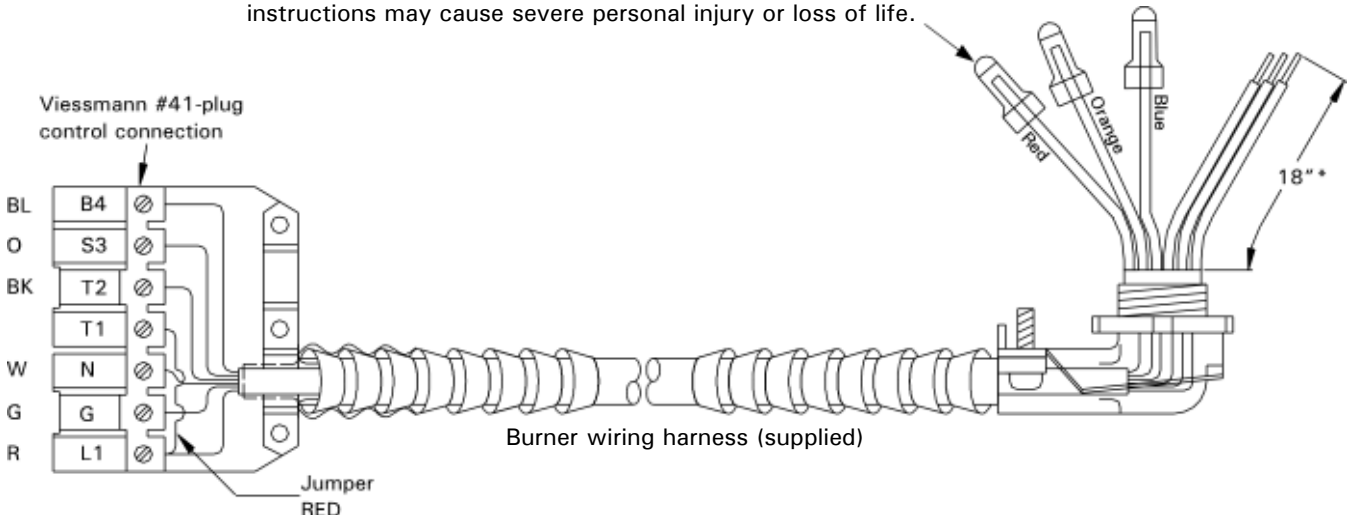
Electrical Connections (with Vitotronic control) *(continued)*

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

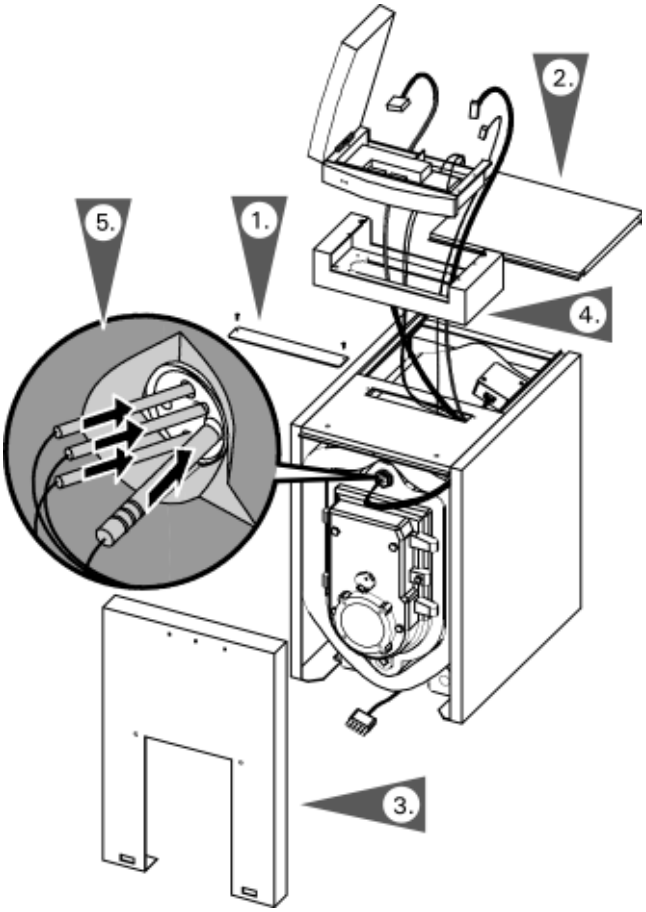
Closed end connectors are factory installed on RED, ORANGE and BLUE wires. These RED,ORANGE and BLUE wires may or may not be used in your burner application. See wiring diagram in this manual which is specific to your burner application. Do not remove or cut any of the closed end connectors of the RED, ORANGE or BLUE wires, unless it is necessary to do so. RED wire is live (120VAC) at all times. Do not remove or cut its closed end connector unless it is necessary to do so. Failure to heed the above instructions may cause severe personal injury or loss of life.

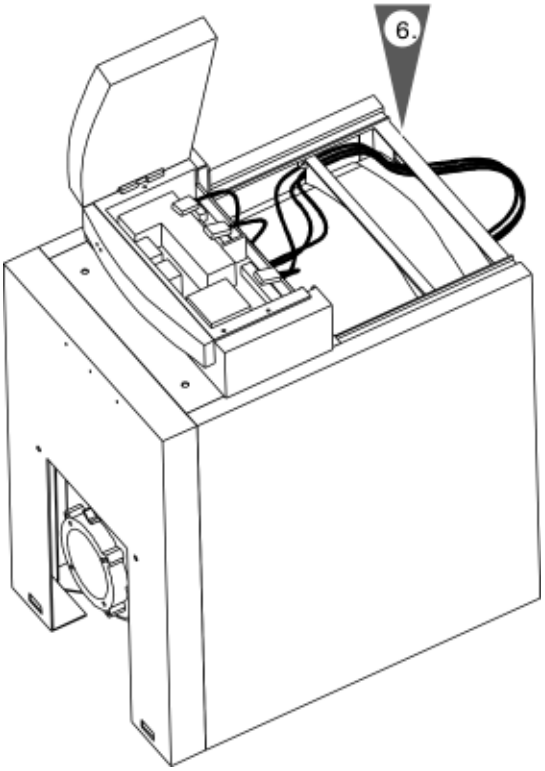


Legend
BL Blue
O Orange
BK Black
W White
G Green
R Red

* If Beckett burner is being installed, cut this length to 6" for connection to burner junction box (located under the burner primary control).

Installation of Vitotronic Control





Refer to Installation Instructions Boiler Control (for all connections to control base)

IMPORTANT

The power supply cable is shipped with the boiler control.

1. Loosen two screws, remove cover plate and discard.
2. Remove top back panel.
3. Remove front panel.
4. Place control console on boiler and fasten with two screws removed in step 1.

WARNING

Do not kink capillaries. Proper operation of sensors is not possible if capillaries are kinked.

IMPORTANT

Boiler temperature sensor 3 is shipped with the boiler control (not applicable to Vitotronic 100, KK10).

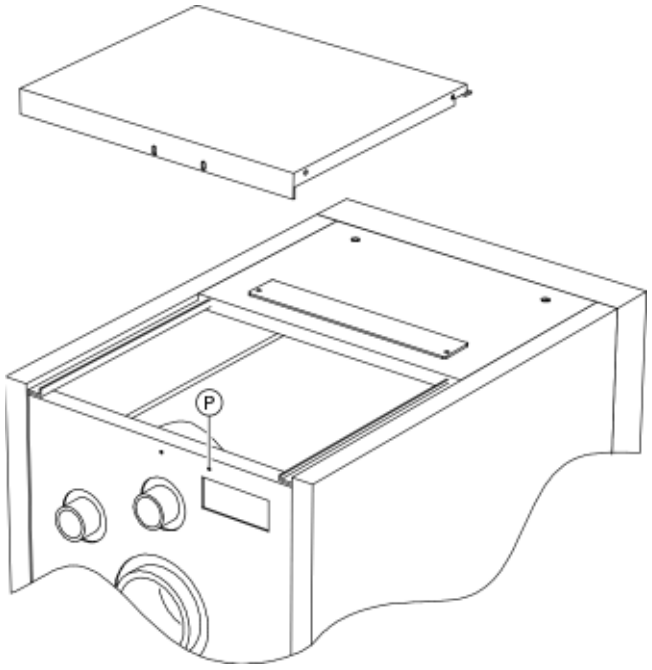
5. Carefully push high limit and boiler temperature sensor 3 behind front panel and into sensor wells as far as possible. Lay excess sensor cabling and capillary tubing on insulation.
6. Channel power supply cable (for Vitotronic 200 KW2 or Vitotronic 100 KW10B) and all other 120 VAC cabling through back opening toward boiler control.
7. Channel low voltage cables (i.e. sensor cables) through cable opening toward boiler control.
8. Coil excess cabling and tuck between side panel and insulation.

WARNING

Always route all cables and capillaries between nylon backed insulation and metal enclosure panels, never directly on cast iron heat exchanger.

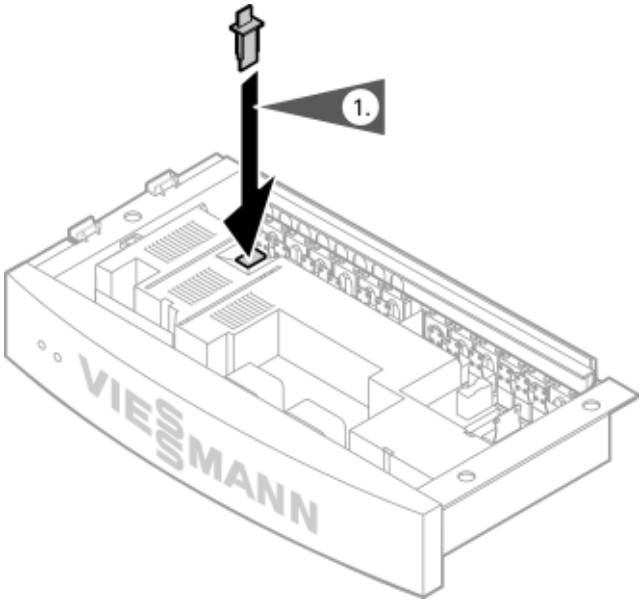
9. Tighten strain reliefs.

Installation of Vitotronic Control *(continued)*



1. To avoid problems with removing the top panel, we recommend moving the top panel screw approximately 3" to the left or right. To do so, pre-drill the panel with an 1/8" drill bit.
   To reinstall the top panel, drill a new 1/8" pilot hole through the top back panel and into the back panel. Reinstall the screw Ⓟ into this new mounting hole.

Boiler Coding Card



IMPORTANT

Only the boiler coding card supplied with the standard equipment of the boiler may be used. The coding card is enclosed in the accessory pack of the boiler.

1. Push boiler coding card through recess in the cover and insert it into plug-in location "X7".

IMPORTANT

If the boiler coding card is not installed the following fault code will be displayed on the boiler control: "b1". Applies to Vitotronic 200 KW2.

Electrical Connections (with GeniSys primary control)

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

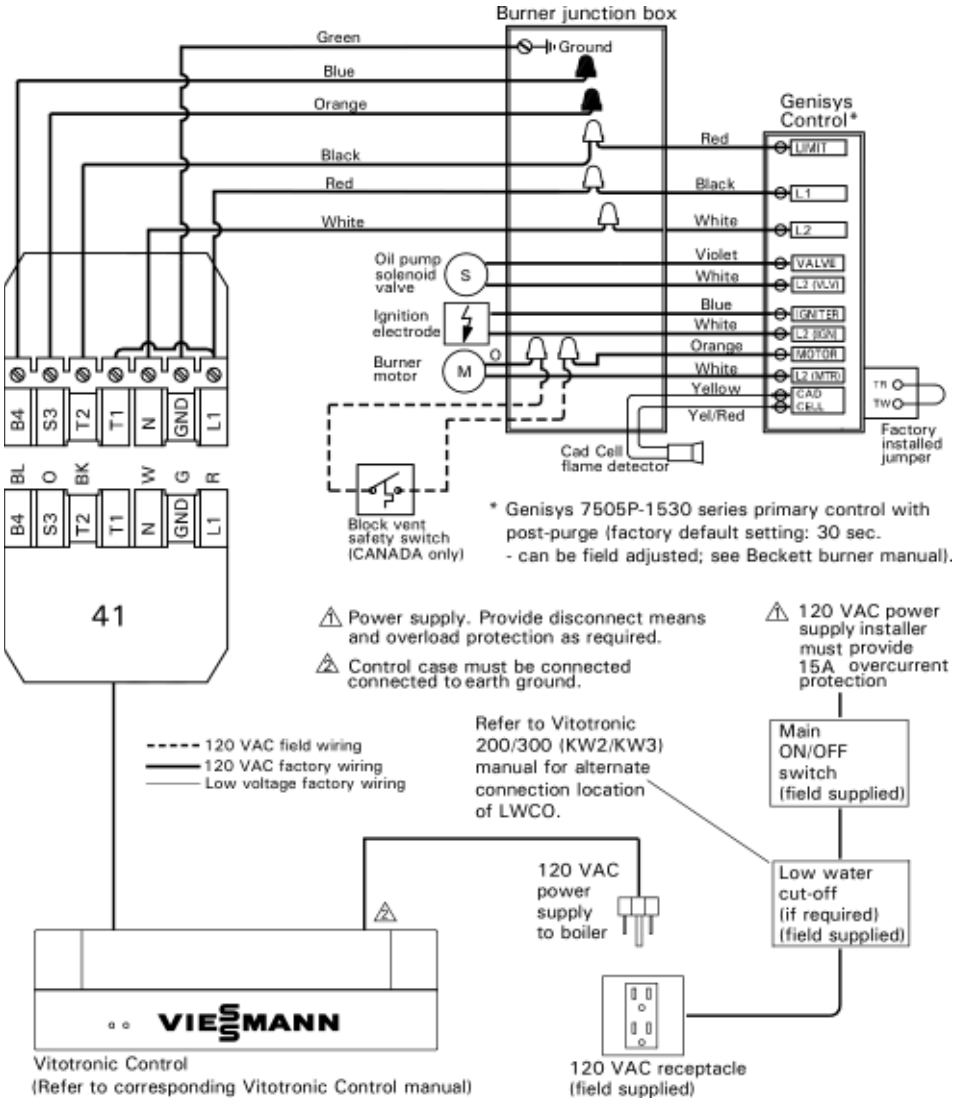
Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any additional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

WARNING

Ensure that the burner cycles ON and OFF on proper call for heat before leaving the job site. Failure to do so may lead to boiler runaway situation, property damage, and personal injury or death.

IMPORTANT

If burner lock-out occurs, verify a blocked vent safety switch operation first.



5583 571 - 01

Burner Installation

Refer to the Instructions supplied with Riello burner

Observe all instructions supplied with the burner.

Burner Information

Fuel
This boiler is for use with the Riello #2 fuel oil burner supplied by Viessmann only. Use only the fuel stated on the rating plate of the burner.

Oil nozzle
The Riello burner for the VR1-33 boiler is shipped with factory setting and oil nozzle installed, and should require only minor adjustments. For VR1-40, and -50 boilers, replace installed nozzle with nozzle packaged with burner.
For Riello burner specifications see table on page 48.

Burner calibration
Ensure that the combustion results of the oil-fired burner mounted on this boiler are verified after start-up.
If adjustments are necessary, always verify results with a calibrated flue gas analyzer.
For Riello burner specifications see table on page 48.

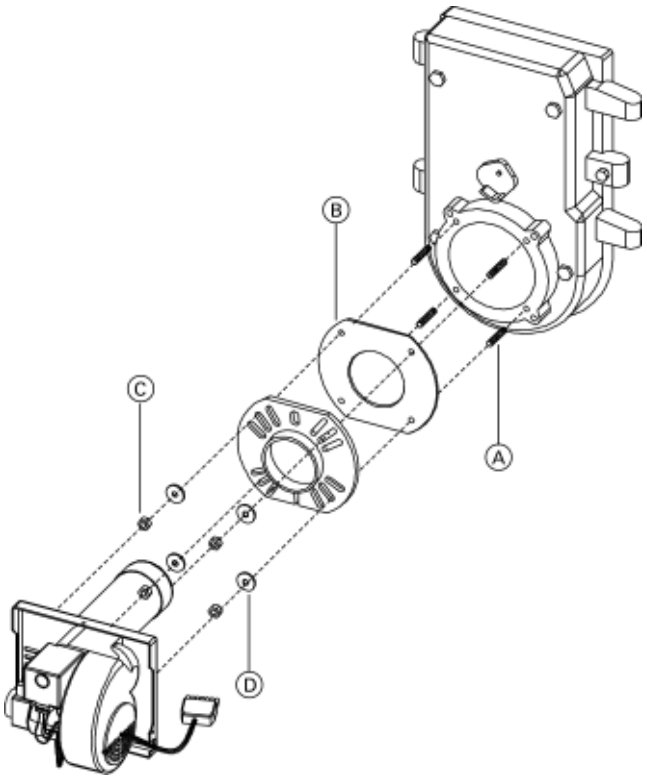
⚠ WARNING

Do not use gasoline crankcase drainings or any oil containing gasoline.

IMPORTANT

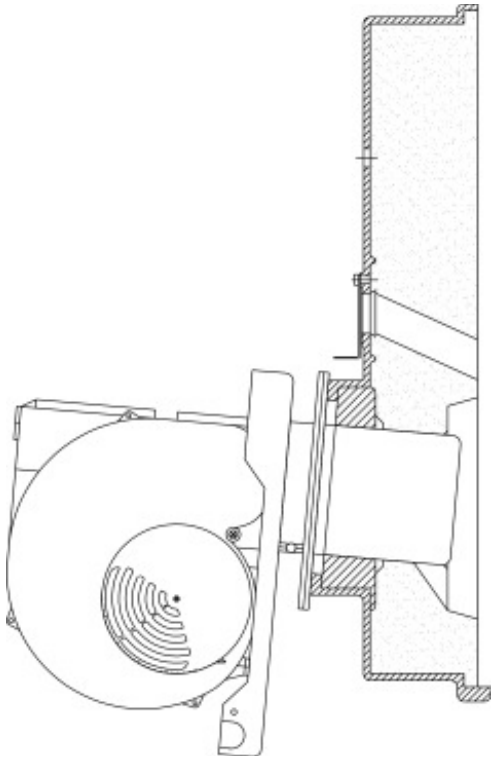
This burner is shipped with the oil pump set to operate on a single line system. To operate on a two-line system, the bypass plug must be installed. The burner is shipped configured for use in single line applications. No changes to the oil pump are required for use in single line applications.

Burner Mounting



Refer to the Instructions supplied with Riello burner

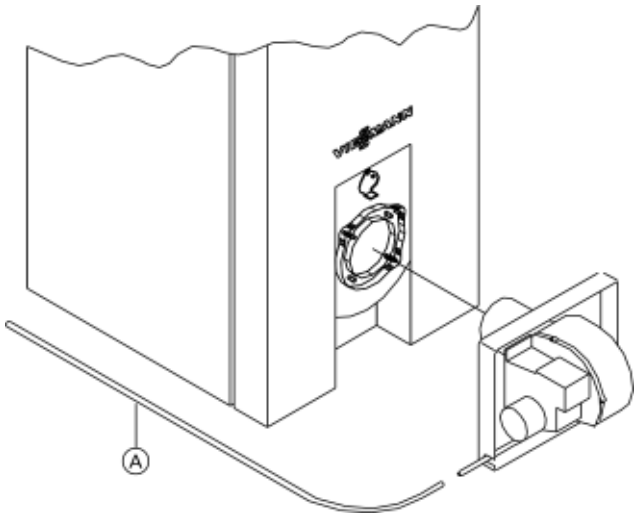
1. Remove burner from carton. The mounting flange has been installed at the factory.
2. Mount four M8 spacer bolts Ⓐ in threaded holes of combustion chamber door.
3. Slide burner gasket Ⓑ over spacer bolts.
4. Mount burner as shown. (For proper insertion lengths see table on page 48).
5. Secure burner with M8 nuts Ⓒ and washers Ⓓ provided.



Burner air tube insertion

Oil Piping Connection

Refer to the Instructions supplied with Riello burner



Legend

Ⓐ Oil line (see local codes for appropriate arrangement and piping of filter control valves, etc., back to oil tank)

IMPORTANT

This burner is shipped with the oil pump set to operate on a single line system. To operate on a two-line system, the bypass plug must be installed. The burner is shipped configured for use in single line applications. No changes to the oil pump are required for use in single line applications.

General oil piping requirements

Location and installation of oil tanks, oil piping and burners must follow:

- Local codes and regulations.
- Information provided with burner and fuel pump.
- In Canada, CSA B139.00, Installation of Oil-Burning Equipment.
- In USA, NFPA 31, Standard for the Installation of Oil-Burning Equipment.

WARNING

Do not use Teflon tape as an oil pipe sealant. It can cause valves to fail, creating hazards. Do not use compression fittings.

Underground oil line piping must be encased to prevent oil leaking into ground. Check local codes for information. If any part of fuel oil tank is above burner level, an anti-siphon device must be used to prevent flow of oil in case of oil line break.

Make tank connections with swing joints or copper tubing to prevent breaking in case the tank settles. Make swing joints so they will tighten as tank settles. Non-hardening pipe joint compounds should be used on all threads.

Do not use Loctite or Teflon tape. Support oil lines as required by codes.

Oil piping connection at burner

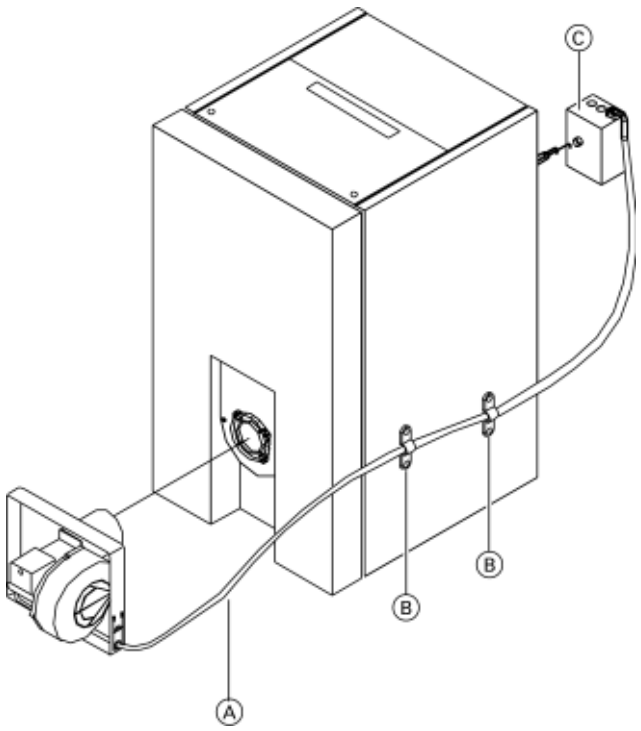
See illustration for recommended connection at burner, allowing burner mounting door to swing open completely for servicing.

WARNING

The oil supply inlet pressure to the fuel unit cannot exceed 3 psig. Install a pressure-limiting device in accordance with the above mentioned codes.

Electrical Connections (with Hydrostat 3250-*Plus* control)

- All field supplied nominal 120 VAC voltage wiring must be sheathed in a flexible metal conduit.
- Disconnect means, overload protection and low water cut-off must be provided as required by local codes.
- Connect incoming line voltage HOT (L1) wire to terminal L1, and N to terminal L2 of the Hydrostat 3250-*Plus* control (see wiring diagram).



Legend
Ⓐ Burner and control harness, (see wiring diagram on page 39)
Ⓑ Cable strap (supplied)
Ⓒ Hydrostat 325-Plus control

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any additional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

Burner wiring

1. Secure control harness Ⓐ using 2 supplied cable straps Ⓑ.

WARNING

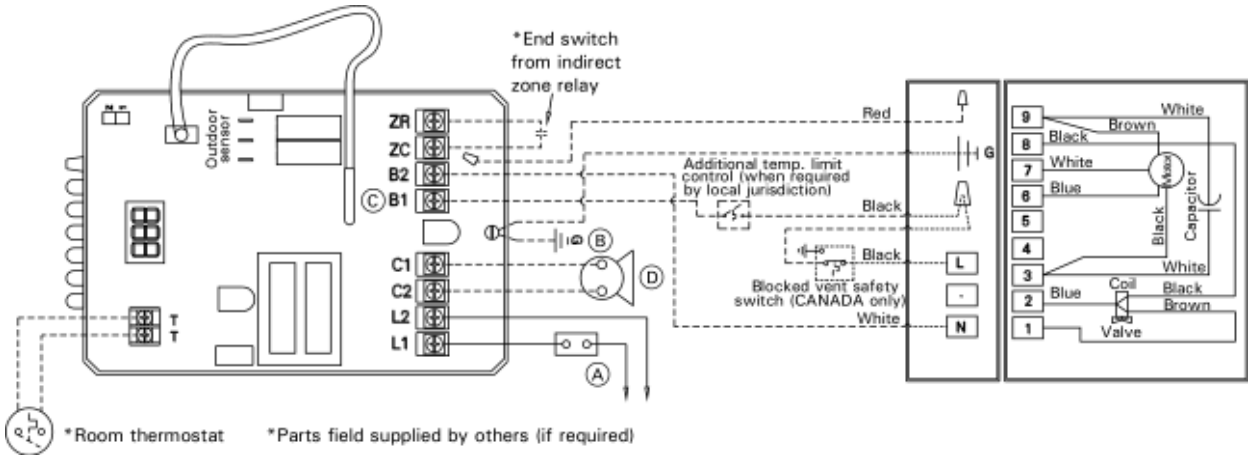
Ensure that burner wiring harness is properly attached and secured to the boiler side panel using the supplied cable straps as depicted above. The cable strap must be coiled on the boiler side panel so that no slack is left, allowing the burner/boiler door to be swung open without disconnecting the burner wiring harness from the burner. Failure to heed this warning may result in personal injury.

Room thermostat wiring

1. Install thermostat on inside wall away from influences of drafts, hot or cold water pipes, lighting fixtures, television, sun rays or fireplaces.
2. Follow instructions supplied with room thermostat. If it has a heat anticipator, set heat anticipator in thermostat to match power requirements of equipment connected to it. Boiler wiring diagrams give setting for standard equipment.

5583 571 - 01

Electrical Connections (with Hydrostat 3250-*Plus* control)



Legend

Ⓐ Power supply, provide disconnect means and overload protection as required.
Ⓑ Control case must be connected to earth ground. Use grounding provided.
Ⓒ B1 is ¼ in. tab terminal.
Ⓓ Circulator

WARNING

Ensure that the burner cycles ON and OFF on proper call for heat before leaving the job site. Failure to do so may lead to boiler runaway situation, which may lead to property damage, personal injury or death.

IMPORTANT

Red wire not used in this application. Use wire nuts to cap both ends (inside high limit control and Riello burner sub- base).

CAUTION

A field supplied manual reset high limit control must be installed at the outlet pipe of the boiler to interrupt burner operation should the factory supplied high limit control fail. This field supplied high limit control must be set 20°F (7°C) above the setting of the factory supplied high limit control. The setting of this field supplied high limit control must never be greater than 220°F (104°C).

Note: Used with standard venting.

Installations must follow these codes and requirements:

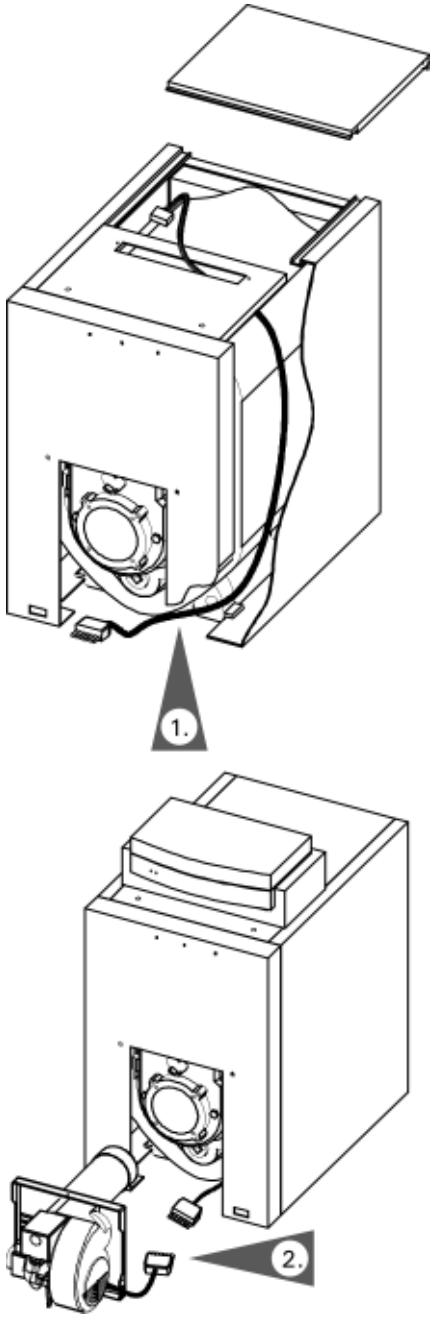
- National Electrical Code, ANSI/NFPA 70, latest edition and any additional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

- All field supplied nominal 120 VAC voltage wiring must be sheathed in a flexible metal conduit.
- Disconnect means, overload protection and low water cut-off must be provided as required by local codes.
- Connect incoming line voltage HOT (L1) wire to terminal L1, and N to terminal L2 of the Hydrostat 3250-*Plus* control (see wiring diagram).

Electrical Connections (with Vitotronic control)



WARNING

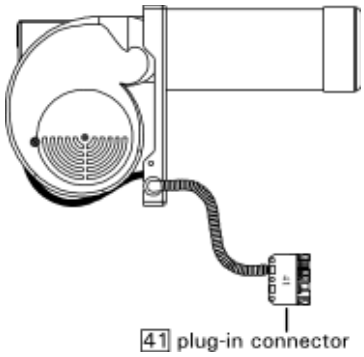
Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

Installations must follow these codes and requirements:

- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

Electrical connections

1. Run the 41 plug-in connector cable of the Vitotronic control down behind the front panel of the boiler and out through the bottom.
2. Connect the female 41 plug of the burner to the male 41 plug of the Vitotronic control.



Room thermostat wiring

1. Install thermostat on inside wall away from influences of drafts, hot or cold water pipes, lighting fixtures, television, sun rays or fireplaces.

2. Follow instructions supplied with room thermostat. If it has a heat anticipator, set heat anticipator in thermostat to match power requirements of equipment connected to it. Boiler wiring diagrams give setting for standard equipment.

5583 571 - 01

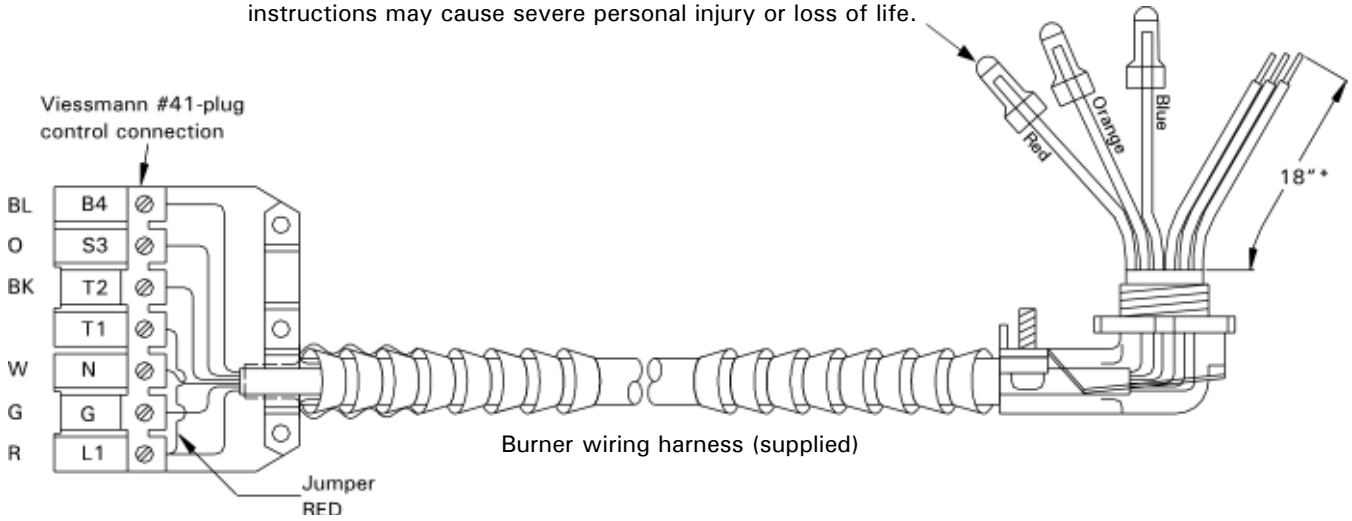
Electrical Connections (with Vitotronic control) *(continued)*

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

Closed end connectors are factory installed on RED, ORANGE and BLUE wires. These RED,ORANGE and BLUE wires may or may not be used in your burner application. See wiring diagram in this manual which is specific to your burner application. Do not remove or cut any of the closed end connectors of the RED, ORANGE or BLUE wires, unless it is necessary to do so. RED wire is live (120VAC) at all times. Do not remove or cut its closed end connector unless it is necessary to do so. Failure to heed the above instructions may cause severe personal injury or loss of life.



Legend
BL Blue
O Orange
BK Black
W White
G Green
R Red

5583 571 - 01

Electrical Connections (with Vitotronic control) *(continued)*

WARNING

Electric shock hazard. Can cause severe personal injury or loss of life if power source, including service switch on boiler, is not disconnected before installing or servicing.

WARNING

RED wire not used in this application. DO NOT cut or remove closed end connector from the wire. (Live 120VAC at all times).

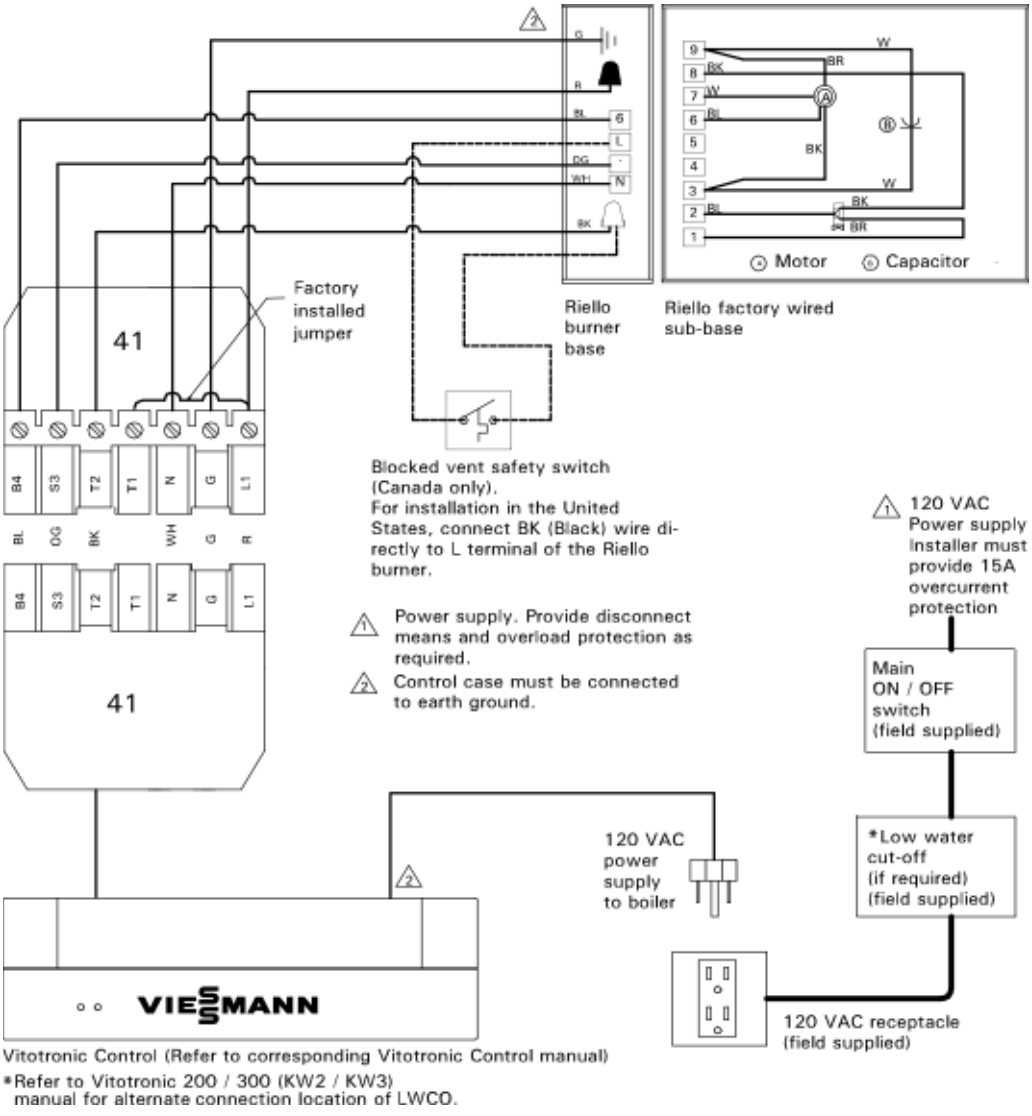
Legend

BL	Blue	R	Red
OG	Orange	Y	Yellow
BK	Black	V	Violet
W	White	BR	Brown
G	Green/Ground	GY	Gray

Installations must follow these codes and requirements:
- National Electrical Code, ANSI/NFPA 70, latest edition and any addtional national, state or local codes.
- In Canada, CSA C22.1 Canadian Electrical Code Part 1 and any local codes.
- Wiring must be N.E.C. Class 1. If original wire as supplied with boiler must be replaced, type 105°C wire or equivalent must be used. Supply wiring to boiler and additional control wiring must be 14 ga. or heavier.
- Provide electrical ground at boiler as required by codes.

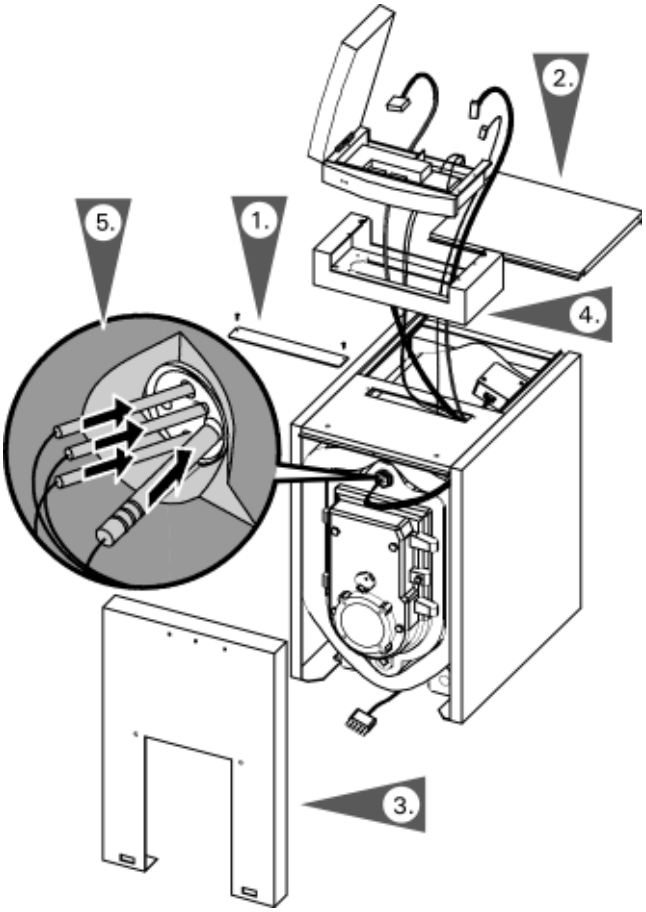
WARNING

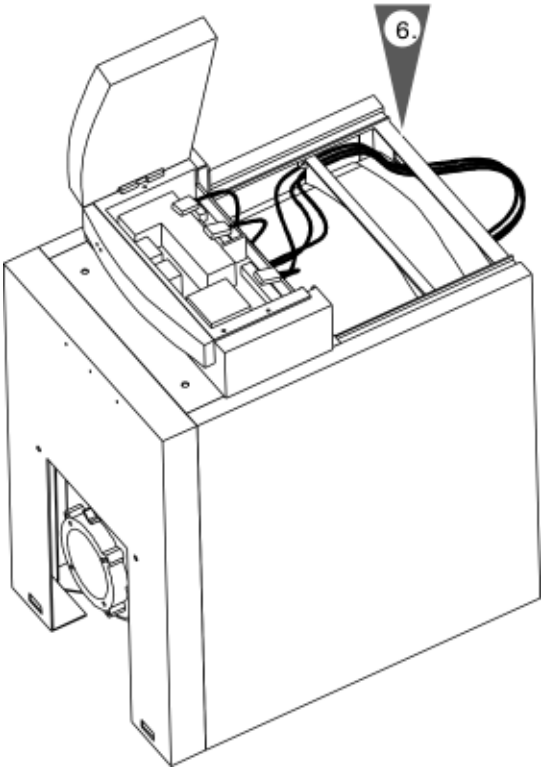
Ensure that the burner cycles ON and OFF on proper call for heat before leaving the job site. Failure to do so may lead to boiler runaway situation, which may lead to property damage, personal injury or death.


Factory installed jumper
Riello burner base
Riello factory wired sub-base
Motor
Capacitor
Blocked vent safety switch (Canada only).
For installation in the United States, connect BK (Black) wire directly to L terminal of the Riello burner.
Power supply. Provide disconnect means and overload protection as required.
Control case must be connected to earth ground.
120 VAC Power supply Installer must provide 15A overcurrent protection
Main ON / OFF switch (field supplied)
*Low water cut-off (if required) (field supplied)
120 VAC power supply to boiler
120 VAC receptacle (field supplied)
Vitotronic Control (Refer to corresponding Vitotronic Control manual)
*Refer to Vitotronic 200 / 300 (KW2 / KW3) manual for alternate connection location of LWCO.

5583 571 - 01

Installation of Vitotronic Control





Refer to Installation Instructions Boiler Control (for all connections to control base)

IMPORTANT

The power supply cable is shipped with the boiler control.

1. Loosen two screws and remove cover plate.
2. Remove top back panel.
3. Remove front panel.
4. Place control console on boiler and fasten with two screws removed in step 1.

WARNING

Do not kink capillaries. Proper operation of sensors is not possible if capillaries are kinked.

IMPORTANT

Boiler temperature sensor 3 is shipped with the boiler control (not applicable to Vitotronic 100, KK10).

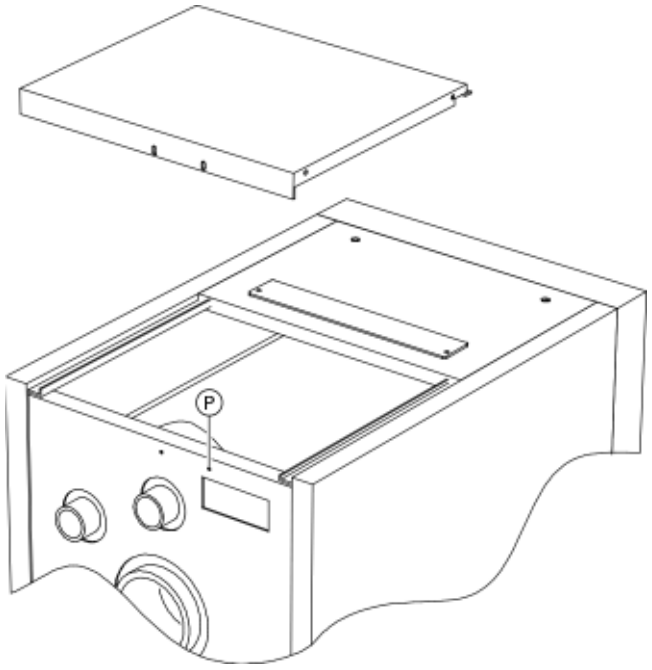
5. Carefully push high limit and boiler temperature sensor 3 behind front panel and into sensor wells as far as possible. Lay excess sensor cabling and capillary tubing on insulation.
6. Channel power supply cable or Power/Pump Module cable (for Vitotronic 200 or Vitotronic 100 KW10B) and all other 120 VAC cabling through back opening toward boiler control.
7. Channel low voltage cables (i.e. sensor cables) through cable opening toward boiler control.
8. Coil excess cabling and tuck between side panel and insulation.

WARNING

Always route all cables and capillaries between nylon backed insulation and metal enclosure panels, never directly on cast iron heat exchanger.

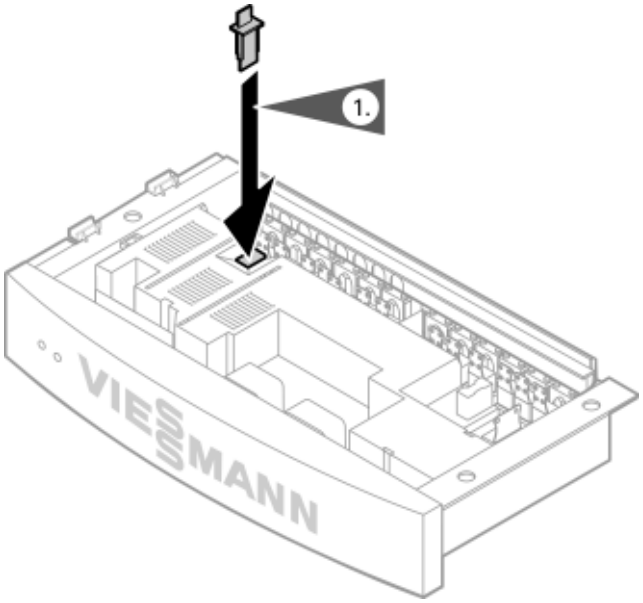
9. Tighten strain reliefs.

Installation of Vitotronic Control *(continued)*



1. To avoid problems with removing the top panel, we recommend moving the top panel screw approximately 3" to the left or right. To do so, pre-drill the panel with an 1/8" drill bit.
   To reinstall the top panel, drill a new 1/8" pilot hole through the top back panel and into the back panel. Reinstall the screw Ⓟ into this new mounting hole.

Boiler Coding Card



IMPORTANT

Only the boiler coding card supplied with the standard equipment of the boiler may be used. The coding card is enclosed in the accessory pack of the boiler.

1. Push boiler coding card through recess in the cover and insert it into plug-in location "X7".

IMPORTANT

If the boiler coding card is not installed the following fault code will be displayed on the boiler control: "61". Applies to Vitotronic 200 KW2.

Initial Start-up

WARNING

Verify completeness of all discussion points on the following pages before starting-up the system.

Refer to the Burner Instructions

1. Ensure fresh air intake of boiler room is open and that chimney and all flue pipes are connected, sealed and unobstructed inside.
2. Ensure proper size and operation of expansion tank. Undersized expansion tanks cause fresh water to be added to the system through fill valve. This will cause premature section failure, which is not covered by warranties.
   Note: If the nitrogen pressure of the precharged expansion tank is less than the static pressure of the system, inflate membrane pressure to slightly exceed pressure of system.
   The static pressure required at the tank is based upon the static height of the system. Normal fill pressure for most residential applications is 12 to 15 psig when the system is cold. A lower pressure gage reading usually indicates loss of water due to leakage. All leaks must be corrected.
   Refer to instructions packaged with automatic fill valve. Follow local regulations with respect to backflow preventers.
3. Fill heating system with water and bleed out air completely. Ensure complete system is properly vented of air.
   Note: Water treatment should be considered in areas where it is known that boiler feed water contains a high mineral content and hardness. Contact local water treatment company.
   In areas where freezing might occur, an antifreeze may be added to the system water to protect the system. Please adhere to the specifications given by the antifreeze manufacturer. Do not use automotive silicate-based antifreeze. Ensure a copy of the Material Safety Data Sheet is left on site.
   Please observe that an antifreeze/water mixture may require a backflow preventer within the automatic water feed and influence components such as diaphragm expansion tanks, radiation, etc. A 40% antifreeze content will provide freeze-up protection to -10°F (-23°C).
   Do not use antifreeze other than specifically made for hot water heating systems. System also may contain components which might be negatively affected by antifreeze. Check total system frequently when filled with antifreeze. Follow anti-freeze manufacturer's instructions.
4. Perform a pressure test of the boiler and the water piping. Pressure test must not exceed 1½ times the maximum operating pressure (45 psi) of the boiler. Pressure relief valve must be removed during pressure test. Any leaks must be corrected.

- the max. operating pressure is 45 psig (310 kPa)
- the max. testing pressure is 68 psig (465 kPa)

5. Ensure proper and adequate fuel supply exists; open oil shut-off valve.

Burner Calibration

WARNING

DO NOT USE GASOLINE, CRANKCASE DRAININGS OR ANY OIL CONTAINING GASOLINE.

WARNING

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.

WARNING

Do not tamper with the unit or controls.

WARNING

DO NOT START THE BURNER UNLESS THE COMBUSTION CHAMBER DOOR IS SECURED IN PLACE.

WARNING

DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE UNIT IS FULL OF VAPOR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

WARNING

Do not fire boiler without water.

WARNING

Do not leave any tools inside combustion chamber.

Refer to the Instructions supplied with the Beckett or Riello burner.

Combustion analysis

This oil burner requires combustion measurements performed at the final installation site, using calibrated combustion equipment, to verify factory settings, or to be used as a guide in changing burner settings to suite local conditions.

Examples of local conditions which influence combustion results include: weather conditions, length of horizontal vent pipe, diameter and height of the chimney, side wall venting (power vent), altitude above sea level, quality and heating value of oil used, maximum number of other fuel burning appliances running at the same time.
These conditions affect the burner set-up. The burner must be adjusted for acceptable combustion results under local conditions of the installation.

Combustion measurements (CO2, stack temperature, draft and CO) are taken in the flue pipe between boiler and barometric draft regulator before dilution air (see the installation manual).
Overfire draft is measured at the combustion chamber observation port opening. Over-fire draft ranges from 0 to +0.01 “w.c.. Breeching draft is approximately -0.02 “w.c.

Note: This boiler is approved for operation with a breeching draft of up to -0.08 “w.c. (when used without a barometric draft regulator). The expected CO2 average range for #2-oil is from 11.0% to 13.0%.

For burner technical data see table on following pages.

Beckett Burner Calibration

Boiler Model No.		VR1-22	VR1-27	VR1-33
Burner model	Beckett	NX-VI 701	NX-VI 702	NX-VI 703
Fuel type	oil	No. 2 fuel oil	No. 2 fuel oil	No. 2 fuel oil
Pump pressure	psig	175	175	175
Oil nozzle	Danfoss	n.a.	0.60x60°AS	n.a.
	Delavan	0.50x60°B	n.a.	0.75x60°A/W
	Hago	0.50x60°B	0.60x60°B	n.a.
Oil nozzle flow rate	GPH@psig	0.65@190	0.75@175	1.00@175
Air tube length	inches mm	7 178	7 178	7 178
Air tube insertion	inches mm	3¼ 83	3¼ 83	3⅝ 92
Air tube combination		NX70LP	NX70LP	NX70LJ
Head type		6-slot	6-slot	9-slot
Head setting		2.00	2.50	3.25
Air setting		see head setting	see head setting	see head setting
Static plate		n.a.	n.a.	n.a.
Baffle		n.a.	n.a.	n.a.
Fuel pump c/w solenoid valve		21844	21844	21844
Flange		32073	32073	32073

Riello Burner Calibration

Boiler Model No.		VR1-22	VR1-27	VR1-33
Burner model	Riello 40 Series	F3	F3*1	F5
Fuel type	oil	No. 2 fuel oil	No. 2 fuel oil	No. 2 fuel oil
Pump pressure	psig	175	175	175
Oil nozzle	Danfoss	0.50x60°xAS	0.60x60°xAS*3	0.75x60°xAS
	Delavan	0.50x60°xSS	0.60x60°xW	0.75x60°xA 0.75x60°xW*2
	Hago	0.50x60°xSS*2	0.60x60°xES	n.a.
Oil nozzle flow rate	GPH@psig	0.65@175	0.75@175	1.00@175
Air tube length	inches mm	7 178	7 178	6 5/16 160
Air tube insertion	inches mm	4 5/8 118	4 5/8 118	4 1/4 108
Air tube combination		0.0	2.0	0.8
Head type		3.1	3.4	2.9

IMPORTANT

*1 For VR1-27 boiler, replace installed nozzle with nozzle packaged with Riello burner.
*2 Factory-installed nozzle.
*3 Nozzles must be installed by installer.

Note: Riello oil burners are factory set for Vitorond 100, VR1-22, and -33 boilers and should only require minor adjustments. Install appropriate nozzle and set the burner for model VR1-27.

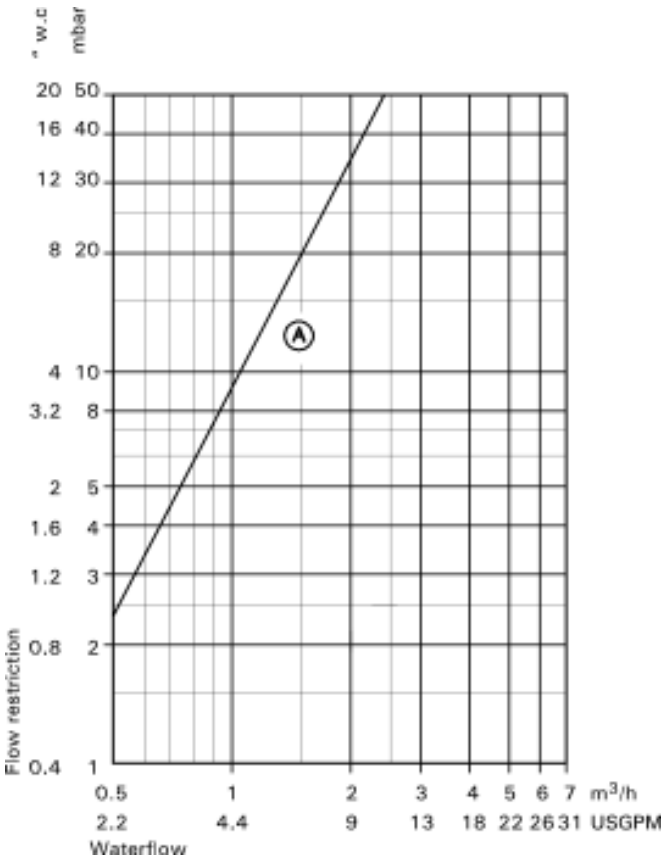
5583 571 - 01

Barometric Draft Regulator

When a barometric draft regulator is used, adjust the barometric draft regulator such that the over-fire draft is 0.00 to +0.01 "w.c., while the breech draft is approximately -0.02 "w.c.

During operation of the burner, the barometric draft regulator installed in the vent system must move freely.

Waterside Flow



Ⓐ VR1-22 to -33

General
The schematics on the following pages are to be seen as guidelines only. They further do not display all system varieties, safety devices, or concepts possible. Specific system layouts may be further discussed with the local Viessmann sales representative office.

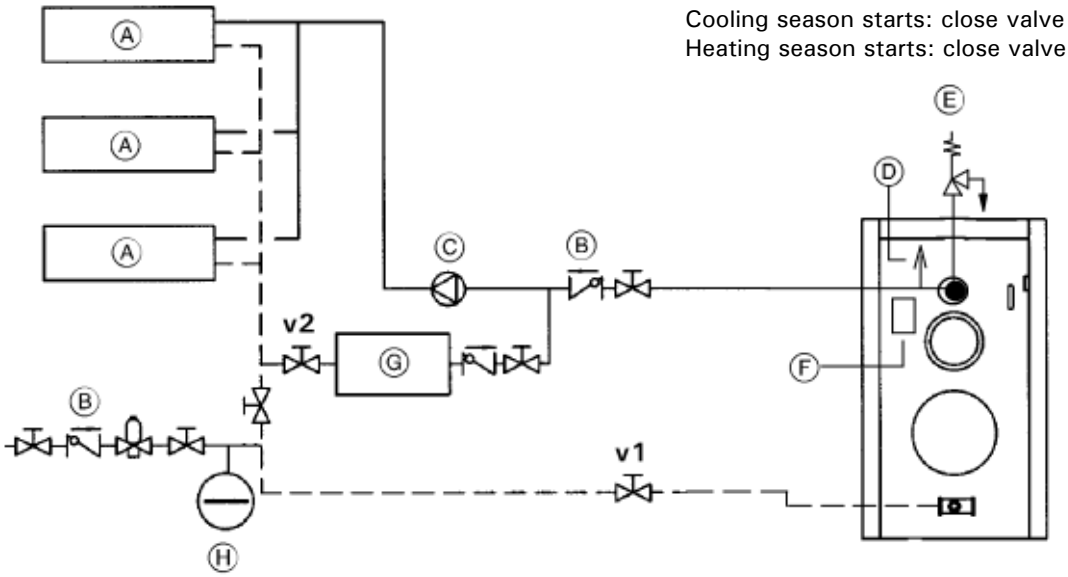
Clearances
A minimum of 2" circumferential clearance from non-insulated hot water pipes to combustible construction must be maintained. In cases where the pipes are insulated with pipe insulation of appropriate and sufficient thickness and insulation values, the above clearance may be reduced to 0".

Flow rates
The relationship between boiler flow rate and temperature rise is according to the formula:
Boiler output (Btu/h) = 500 x flow (USGPM) x Rise (°F)

The following chart lists typical flow rates for the Vitorond boiler:

Boiler model No.		VR1-22	VR1-27	VR1-33
20° F rise	USGPM	8	9.2	12.2
	(m3/h)	(1.8)	(2.1)	(2.8)
30° F rise	USGPM	5.3	6.1	8.1
	(m3/h)	(1.2)	(1.4)	(1.8)

Installation Examples - Hydrostat



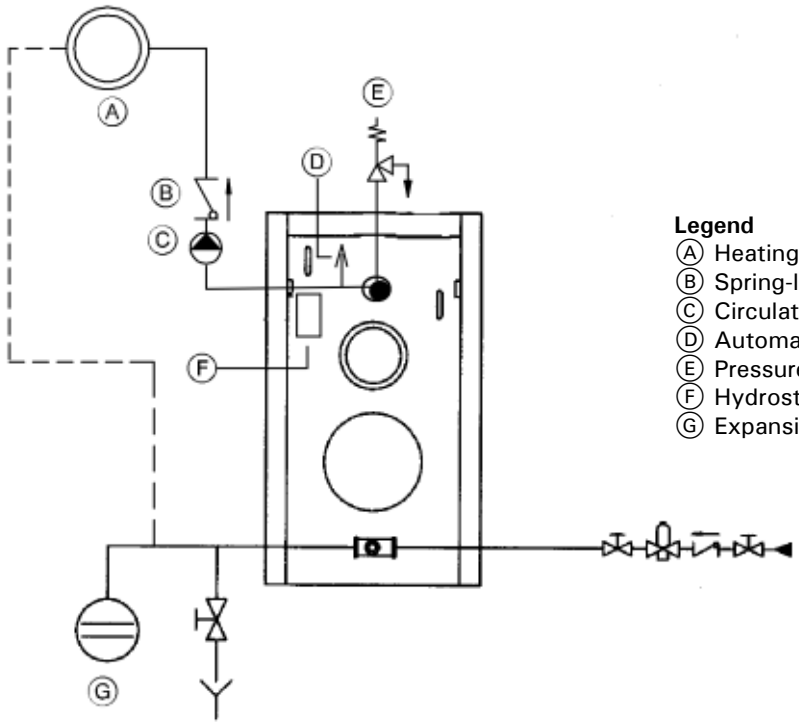
Boiler in a heating/cooling application

Cooling season starts: close valve v1 and open valve v2
Heating season starts: close valve v2 and open valve v1

Legend
Ⓐ Heating/Cooling unit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent,
Ⓔ Pressure relief valve
Ⓕ Hydrostat 3250-*Plus* (with low water cut-off)
Ⓖ Water chiller
Ⓗ Expansion tank

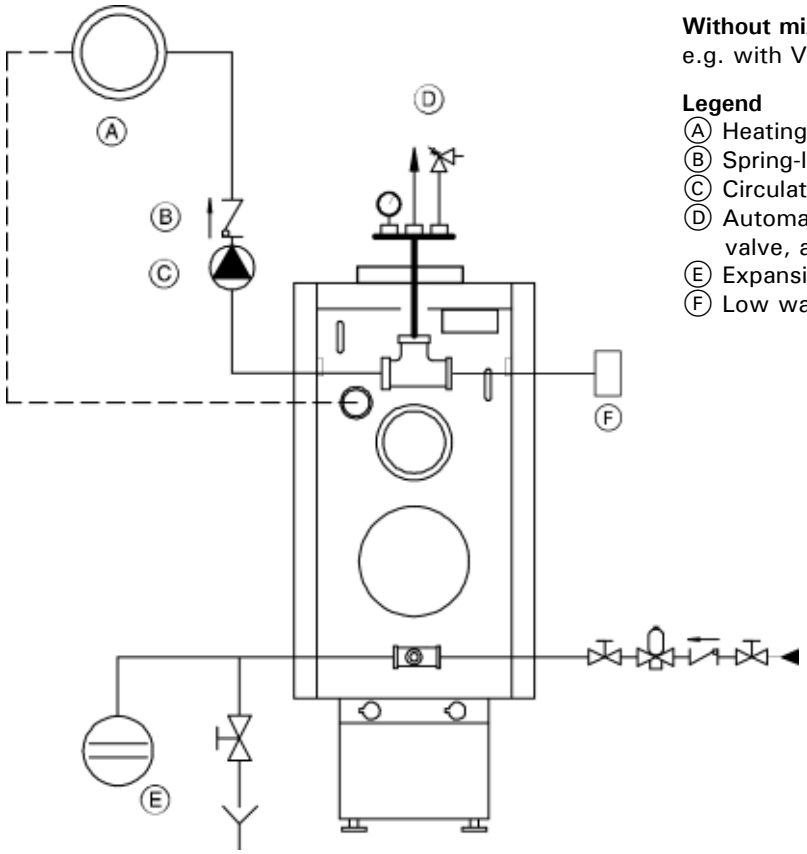
IMPORTANT

We strongly suggest that the valves be labelled "v1" and v2."



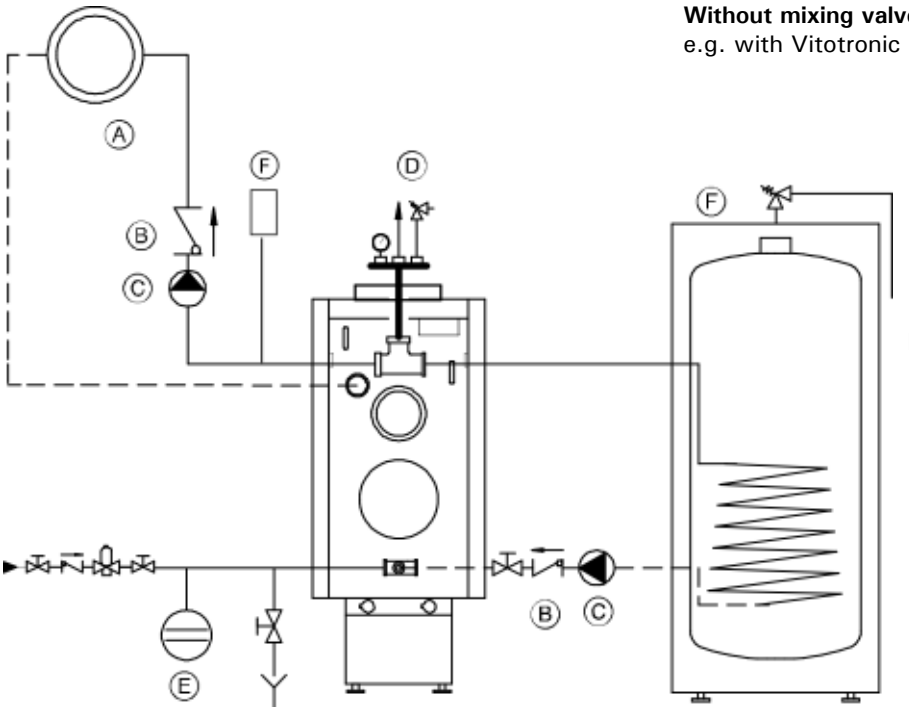
Legend
Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent,
Ⓔ Pressure relief valve
Ⓕ Hydrostat 3250-*Plus* (with low water cut-off)
Ⓖ Expansion tank

Installation Examples - Vitotronic



Without mixing valve
e.g. with Vitotronic 100, Model KW10B

Legend
Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent, (field supplied), pressure relief valve, and temperature pressure gage
Ⓔ Expansion tank
Ⓕ Low water cut-off (if required)



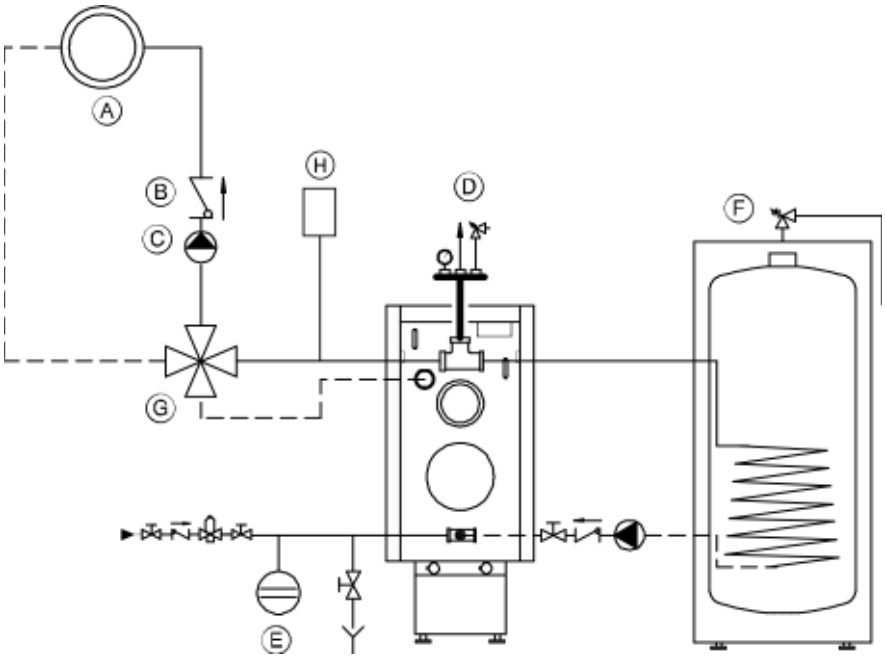
Without mixing valve and with DHW
e.g. with Vitotronic 100, KW10B

Legend
Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent, (field supplied), pressure relief valve, and temperature pressure gage
Ⓔ Expansion tank
Ⓔ Domestic hot water storage tank (indirect-fired)
Ⓕ Low water cut-off (if required

Installation Examples - Vitotronic *(continued)*

With one low-temperature circuit with 4-way mixing valve, and with domestic hot water production

e.g. with Vitotronic 200, Model KW2 combined with one mixing valve actuator accessory kit



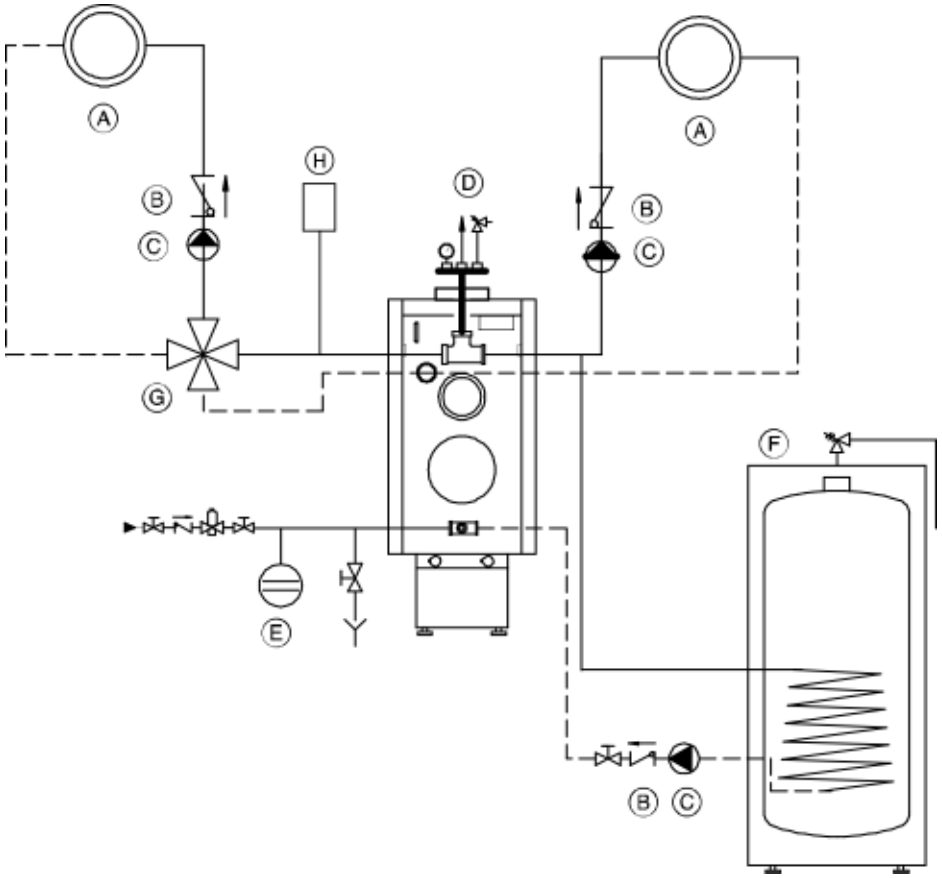
Legend

Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent, (field supplied), pressure relief valve, and temperature pressure gage
Ⓔ Expansion tank
Ⓕ Domestic hot water storage tank (indirect-fired)
Ⓖ 4-Way mixing valve
Ⓗ Low water cut-off (if required)

Installation Examples - Vitotronic *(continued)*

With one low-temperature circuit with 4-way mixing valve, one high temperature circuit, and with domestic hot water production

e.g. with Vitotronic 200, Model KW2 combined with one mixing valve actuator accessory kit



Legend

Ⓐ Heating circuit
Ⓑ Spring-loaded flow check valve
Ⓒ Circulation pump
Ⓓ Automatic air vent, (field supplied), pressure relief valve, and temperature pressure gage
Ⓔ Expansion tank
Ⓕ Domestic hot water storage tank (indirect-fired)
Ⓖ 4-Way mixing valve
Ⓗ Low water cut-off (if required)

Necessary Tools

⚠ WARNING

Ensure that warning concerning fiberglass wool and ceramic fiber materials on page 3 has been read and understood before handling insulation.

⚠ WARNING

NEVER ADJUST BURNER BY EYE.

IMPORTANT

Use only calibrated equipment.

Testing/analysis equipment

- Calibrated flue gas analyzer

Cleaning supplies

- Hand brush
- Rags
- Vacuum cleaning

Possible replacement parts

- Rope sealant for combustion chamber door
- Refractory for combustion chamber door

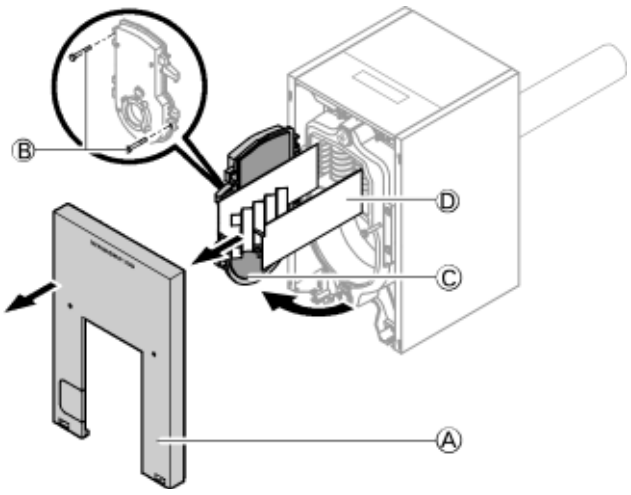
Service Procedure

Shut-down heating system

1. Ensure main power supply to equipment, the heating system, and all external controls has been deactivated. Take precautions in both instances to avoid accidental activation.
2. Close main oil supply valve near burner and near tank.

⚠ WARNING

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.



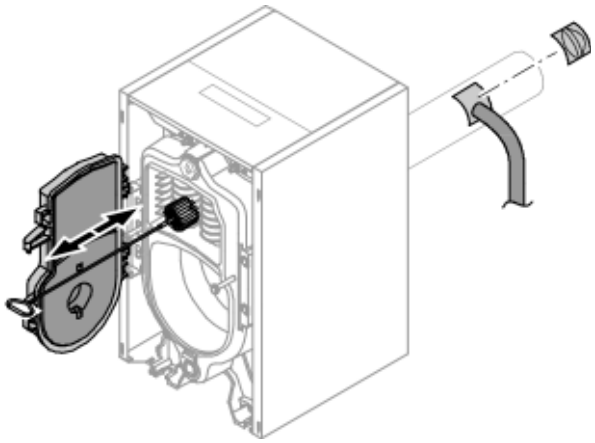
Open combustion chamber door

1. Disconnect power supply.
2. Remove front panel Ⓐ by lifting panel up and out.
3. Remove two bolts Ⓑ of combustion chamber door Ⓒ and open. Continued on following page.
4. Remove turbulators, if applicable. See page 59 for details.
5. Remove combustion chamber insert (if applicable).

⚠ WARNING

Never burn garbage or paper in the unit, and never leave combustible material around it.

Service Procedure *(continued)*



Clean heat exchanger and flue pipe

1. Clean heat exchanger with field supplied cleaning brush and use vacuum cleaner to remove all sediment.
2. Remove all sediment from flue pipe and flue gas collector using vacuum cleaner.

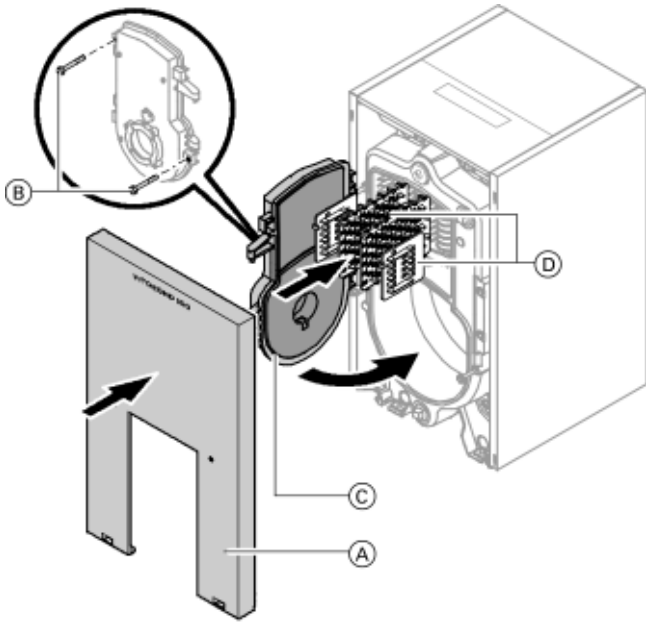
Check all gaskets and insulation

⚠ WARNING

Ensure that warning concerning fiberglass wool and ceramic fiber materials on page 3 has been read and understood before handling insulation.

1. Check all gaskets and the sealant rope of the combustion chamber door for wear or damage.
2. Check the combustion chamber door refractory for wear or damage.

3. Replace worn or damaged parts.



Close combustion chamber door

1. Reinsert flue gas turbulators Ⓓ.
2. Reinstall combustion chamber insert (if applicable).
3. Close combustion chamber door Ⓒ and tighten two bolts Ⓑ in an even fashion.

⚠ WARNING

Reconnect oil burner and follow instructions found in burner installation/start-up manual.

4. Install front panel Ⓐ.
5. Fasten burner hood (if applicable) and lock in place.

⚠ WARNING

Do not leave any tools inside combustion chamber.

Service Procedure *(continued)*

Check heating system and domestic hot water connections

Ensure all connections are pressure tight.

Ensure proper operation of all safety devices

Check pressure gage, air vent and pressure relief valve. Ensure pressure relief valve does not leak. Also ensure pressure relief valve operates in accordance with information provided by the manufacturer.

Ensure proper operation of expansion tank, low water cut-off (if applicable) and pumps

Refer to maintenance instructions supplied with diaphragm expansion tanks, low water cut-offs, pumps, etc. Flush float water type low water cut-offs (if used). The usual water fill pressure is between 10 and 15 psi with the system cold. A lower pressure gage reading usually indicates loss of water due to leakage.
All leaks must be corrected. Refer to instructions packaged with automatic fill valve. Follow local regulations with respect to backflow preventers.
If oil-lubricated pumps are used, ensure proper lubrication.
If motorized zone valves are used, refer to maintenance instructions provided with zone valves. If an older non-diaphragm expansion tank is used, ensure the correct water level is present.

Ensure that an adequate combustion air supply exists in the boiler room

Ensure fresh air intake of boiler room is open. This opening must never be blocked or partially covered.

Ensure functionality of the barometric draft regulator of the burner

During operation of the burner, the barometric draft regulator installed in the vent system must move freely.

Service Procedure *(continued)*

⚠ WARNING

DO NOT USE GASOLINE, CRANKCASE DRAININGS OR ANY OIL CONTAINING GASOLINE.

⚠ WARNING

Always keep the manual fuel supply valve shut off if the burner is shut down for an extended period of time.

⚠ WARNING

Do not tamper with the unit or controls.

⚠ WARNING

DO NOT START THE BURNER UNLESS THE COMBUSTION CHAMBER DOOR IS SECURED IN PLACE.

⚠ WARNING

DO NOT ATTEMPT TO START THE BURNER WHEN EXCESS OIL HAS ACCUMULATED, WHEN THE UNIT IS FULL OF VAPOR, OR WHEN THE COMBUSTION CHAMBER IS VERY HOT.

⚠ WARNING

Do not fire boiler without water.

⚠ WARNING

Do not leave any tools inside combustion chamber.

Calibrate the burner

Refer to the Instructions supplied with the Beckett or Riello burner.

Note: For burner technical information refer to table on page 47 or page 48.

Combustion analysis

This oil burner requires combustion measurements performed at the final installation site, using calibrated combustion equipment, to verify factory settings, or to be used as a guide in changing burner settings to suite local conditions.

Examples of local conditions which influence combustion results include: weather conditions, length of horizontal vent pipe, diameter and height of the chimney, side wall venting (power vent), altitude above sea level, quality and heating value of oil used, maximum number of other fuel burning appliances running at the same time.
These conditions affect the burner set-up. The burner must be adjusted for acceptable combustion results under local conditions of the installation.

Combustion measurements (CO2, stack temperature, draft and CO) are taken in the flue pipe between boiler and barometric draft regulator before dilution air (see the installation manual).
Overfire draft is measured at the combustion chamber observation port opening. Over-fire draft ranges from 0 to +0.01 “w.c.. Breeching draft is approximately -0.02 “w.c.

Note: This boiler is approved for operation with a breeching draft of up to -0.08 “w.c. (when used without a barometric draft regulator). The expected CO2 average range for #2-oil is from 11.0% to 13.0%.

For direct vent application, refer to the Direct Vent System Installation Instructions.

Parts List

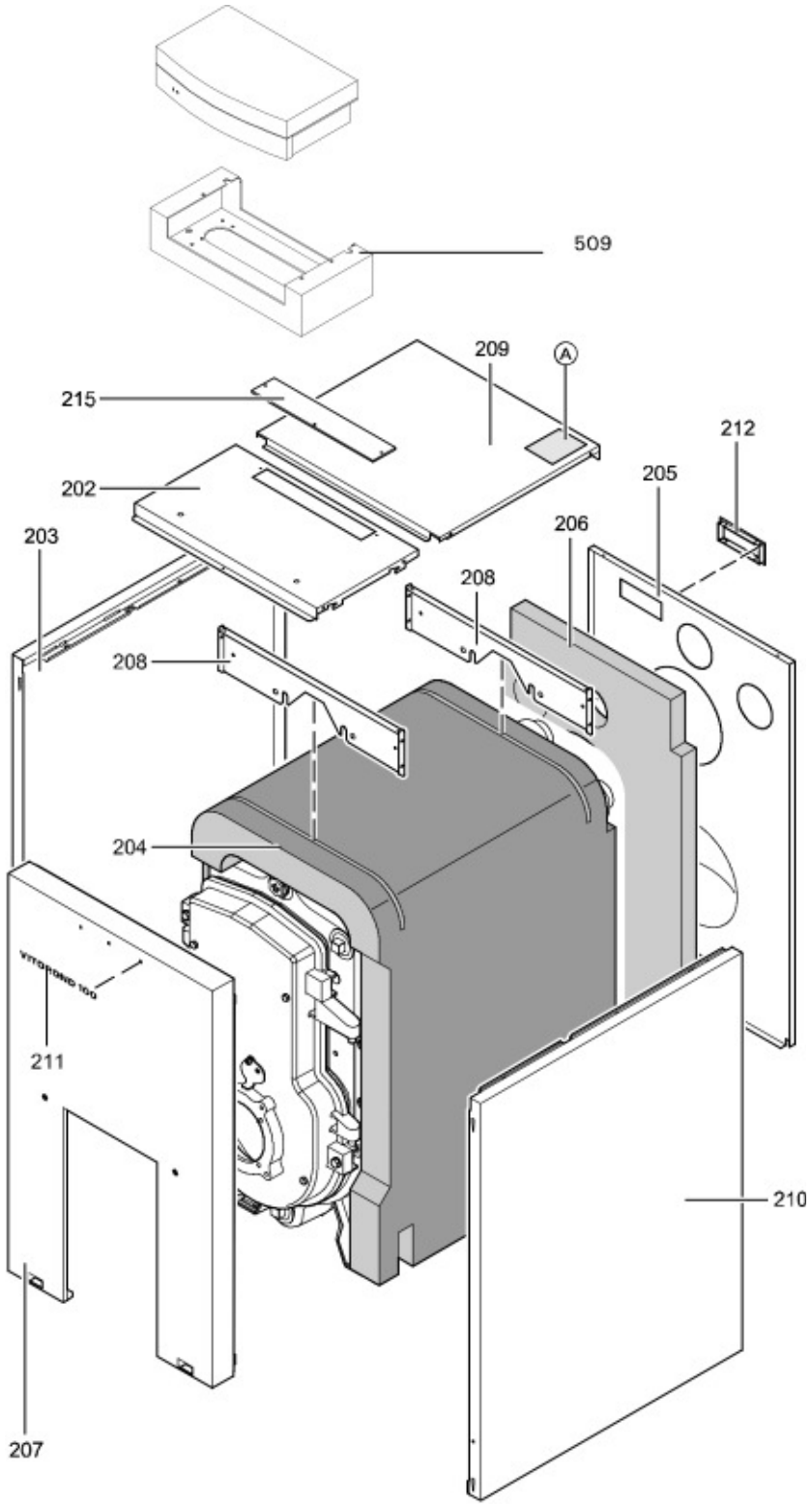
Model No.	Serial No.
VR1-22 Boiler	7249048
VR1-27 Boiler	7249049
VR1-33 Boiler	7249050

Ordering Replacement Parts:
Please provide boiler Model and Serial Number from rating plate when ordering replacement parts. Order replacement components from your Viessmann distributor.

Parts
202 Top panel, front
203 Side panel, left
204 Insulation blanket
205 Back panel
206 Insulation blanket, rear
207 Front panel
208 Support bracket
209 Top panel, rear
210 Side panel, right
211 Nameplate "Vitorond 100"
212 Cover, edge molding
215 Cover plate
509 Vitotronic retrofit housing

Other Parts (not illustrated)
300 Touch-up spray paint, Vitotec, silver
301 Touch-up paint stick, Vitotec silver
304 Accessory pack,
small parts for insulation jacket
400 Installation fittings for Hydrostat applications
500 Installation fittings for Vitotronic applications
600 Installation, Service and Operating Instructions
602 Warranty Sheet, Cast iron/Residential

Ⓐ Rating plate (location of serial no.)



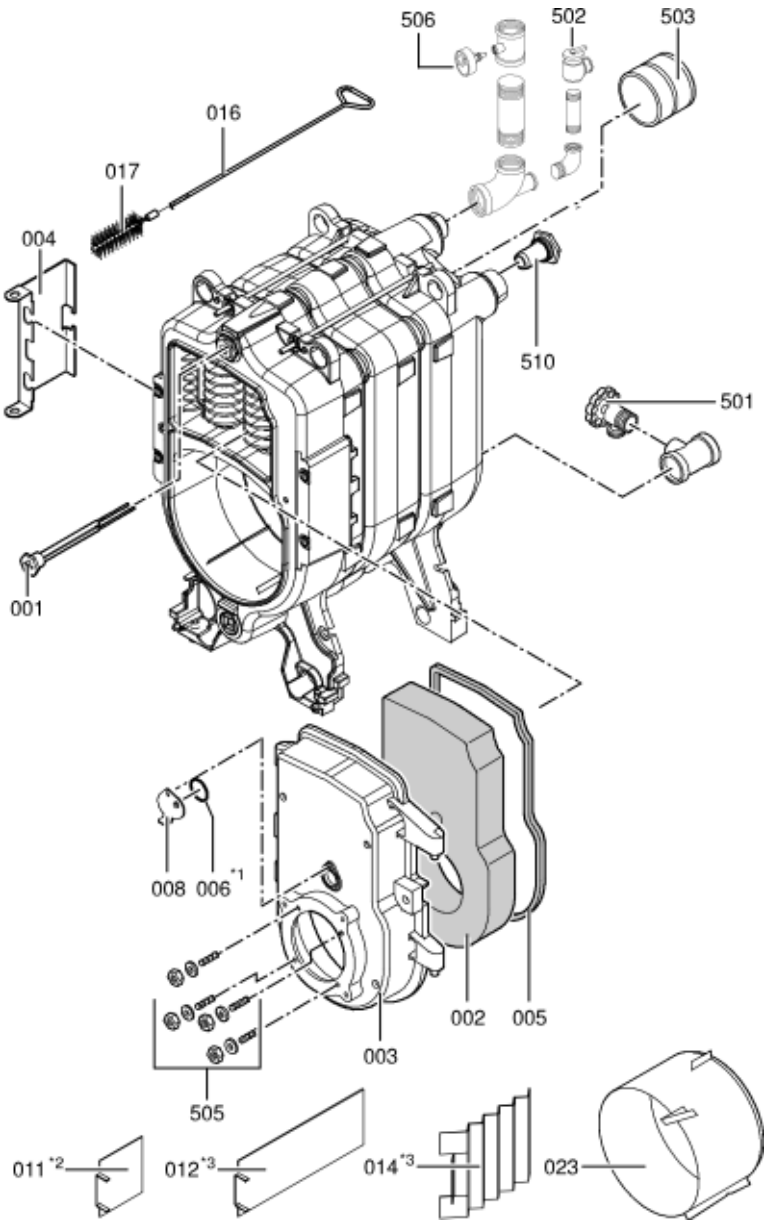
5583 571 - 01

Parts List *(continued)*

Parts
001 5-Point sensor well
002 Combustion chamber door refractory
003 Combustion chamber door
004 Hinge bracket
005 Glass-fiber gasket,16 x 12 L = 2000 mm
006 Glass-fiber gasket, 3x116 mm*1
008 Observation port cover
011 Turbulator insert, x2 2nd pass, VR1-22 *2
012 Turbulator insert, x2, VR1-33 *3
014 Turbulator insert, x1, VR1-33 *3
023 Combustion chamber insert

500 Installation fittings for Vitotronic
501 Sediment faucet, ¾" NPT
502 Pressure relief valve, 30 psig
503 Vent pipe adaptor, 5"
504 Junction box *4
505 Accessory Pack,
burner installation hardware
506 Temperature and pressure gage
507 Control cable with #41 plug *4
508 Burner cable (#41) *4
509 Vitotronic retrofit housing *4
510 Return injector nozzle

Wear Parts
016 Cleaning brush handle 800 mm, M10 *5
017 Cleaning brush (no handle) *5
*1 Sold with adhesive
*2 for VR1-22 only
*3 for VR1-33 only
*4 not shown on diagram
*5 optional - not standard equipment of boiler



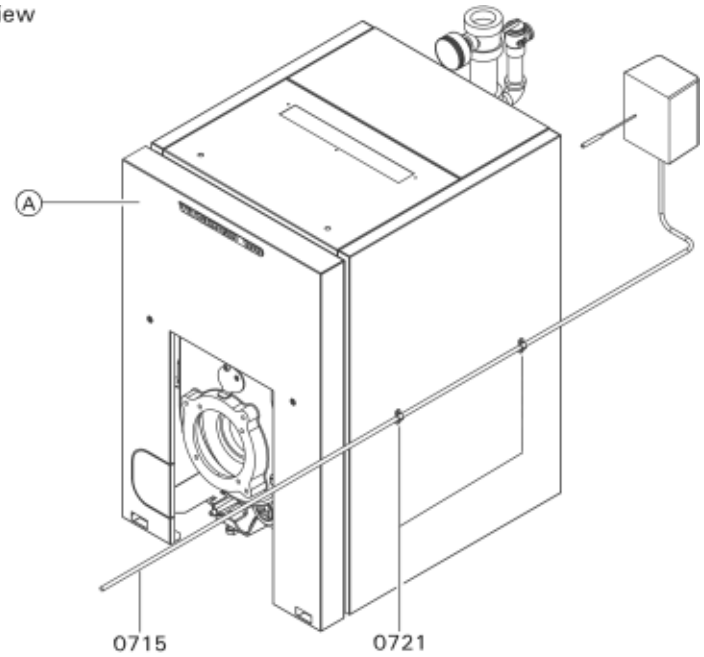
Parts List *(continued)*

Parts List
0701 Hydrostat control, 3250-*Plus*
0702 Electro well, extended ¾" NPT
0703 Hex bushing, 1¼" x ¾"
0704 Temperature and pressure gage
0705 Reduction tee, 1½" x 1½" x ½"
0706 Nipple, 1½" x 5"
0707 Reduction tee, 1½" x ¾" x 1½"
0708 90° Street elbow, ¾"
0709 Nipple, ¾" x 3½"
0710 Pressure relief valve, 30 psig
0711 Reduction tee, 1½" x 1½" x ¾"
0712 Sediment faucet
0713 Vent pipe adaptor, 5"
0715 Burner cable 85" (4-wire)
0721 Cable clamp

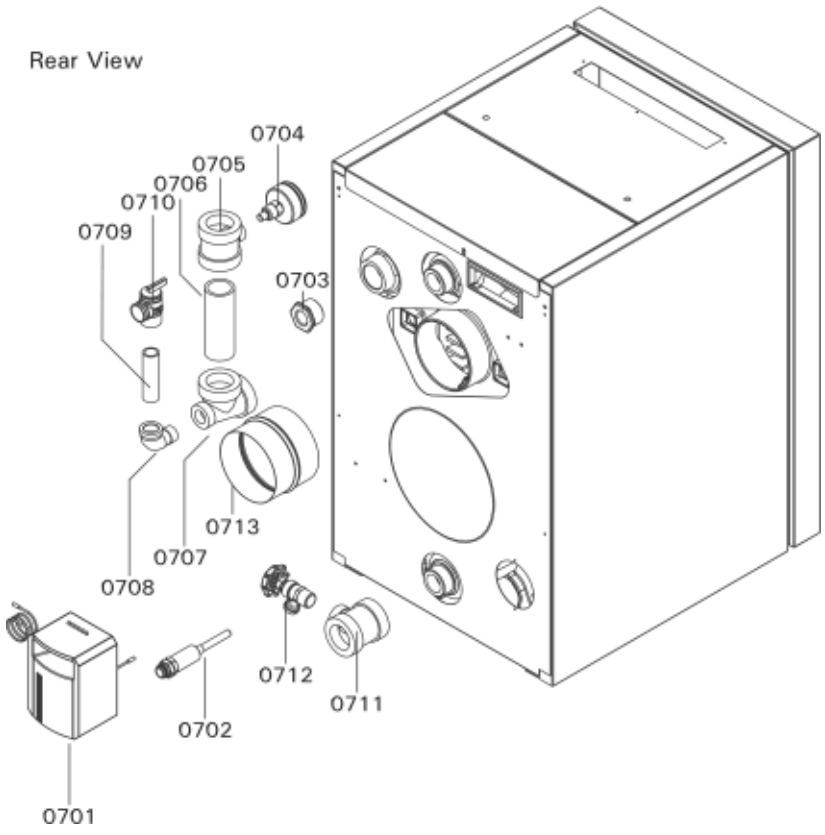
Other Parts (not illustrated)
0717 Accessory pack (burner installation hardware)
0722 Remote mounting kit (with 48" sensor cable)
0730 Installation, Operation and Service Instructions
0732 Installation, Operating Instructions, Hydrostat, 3250-*Plus*
0733 Installation Instructions, Direct Vent
0734 Warranty Sheet Cast-Iron, Residential
0735 Parts List, Installation Set

Ⓐ Vitorond boiler see separate parts list

Front View



Rear View



5583 571 - 01

Maintenance Record

	Start-up	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service	Maintenance/Service
on:					
by:					

⚠ WARNING

Neglecting to perform necessary maintenance can cause unsafe operation.

Before each heating season begins, have the following service and maintenance done by a licensed, professional heating contractor:

1. Boiler heat exchanger inspected and cleaned.
2. Vent system inspected for deterioration, leaks, corrosion, proper draft, and proper operation. Check vent system for compliance with local and national code requirements. Repair or replace as required.
3. Burner checked, and if necessary, adjusted for proper combustion and operation. Check for adequate supply of fresh outside combustion and ventilation air.

Quick Reference

°C	°F
-40	-40
-35	-31
-25	-13
-20	-4
-18	0
-16	+3
-14	+7
-12	+10
-10	+14
-9	+16
-8	+18
-7	+19
-6	+21
-5	+23
-4	+25
-3	+27
-2	+28
-1	+30
0	+32
+1	+34
+2	+36
+3	+37
+4	+39
+5	+41
+6	+43
+7	+45
+8	+46
+9	+48
+10	+50
+12	+54
+14	+57
+16	+61
+18	+64
+20	+68
+25	+77
+30	+86
+35	+95
+40	+104
+50	+122
+60	+140
+70	+158
+80	+176
+90	+194
+100	+212
+110	+230

Printed on environmentally friendly (recycled and recyclable) paper.

Technical information subject to change without notice.

Viessmann Manufacturing Company Inc.
750 McMurray Road
Waterloo, Ontario • N2V 2G5 • Canada
TechInfo Line 1-888-484-8643
1-800-387-7373 • Fax (519) 885-0887
www.viessmann.ca • info@viessmann.ca

Viessmann Manufacturing Company (U.S.) Inc.
45 Access Road
Warwick, Rhode Island • 02886 • USA
TechInfo Line 1-888-484-8643
1-800-288-0667 • Fax (401) 732-0590
www.viessmann-us.com • info@viessmann-us.com

5583 571 - 01